# APPENDIX C
# CITY OF BEVERLY HILLS (COBH) TECHNICAL SPECIFICATIONS FOR DUCTILE IRON (DI) PIPE

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# SPECIFICATIONS

# and

# STANDARD CONTRACTUAL REQUIREMENTS

## Construction of

## WATER MAIN RELOCATIONS –S

## Within the City of

## BEVERLY HILLS, CALIFORNIA

**PUBLIC WORKS DEPARTMENT**
**BEVERLY HILLS, CALIFORNIA**

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**Approved As To Form:**

**January 2014**
**Project No. 10101**

**City Attorney**

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# SECTION 3

# CONSTRUCTION REQUIREMENTS AND MATERIALS

## 3-01 REMOVAL AND DISPOSAL OF MATERIALS

All materials removed must be hauled away from the project site on the same working day and legally disposed of and/or recycled at a site located outside the City limits of Beverly Hills. The Contractor shall recycle materials whenever possible. If the Contractor recycles materials in accordance with the requirements of AB 939, the City shall be provided documentation as to the weight of the material.

Except as otherwise specifically authorized by the City Engineer, all self-propelled equipment used by the Contractor in excavation, breaking and removal operations for street improvement work shall be equipped with rubber tires.

## 3-02 AVOIDANCE OF DUST NUISANCE

The Contractor shall take all necessary measures in order to avoid the nuisance of excessive dust resulting from the process of breaking, reconstructing and removing any materials on the project site. Such measures shall be employed for the duration of the contract work. Refer to SP-23 and Division 1 of the Specifications.

## 3-03 STORAGE OF MATERIALS IN PUBLIC STREETS

The Contractor shall not store equipment or material within public streets or right-of-ways outside of the specified working hours.

## 3-04 PCC SPECIFICATIONS

The Contractor shall comply with the requirements set forth in Section 303-5 of the Standard Specifications for the construction of PCC improvements. Curb, gutter, curb ramps, sidewalk, driveway approaches shall be Class 520 C 2500 concrete. Alley gutter, cross gutter, local depression, alley approaches, appurtenances and foundations for water system appurtenances shall be Class 560 C 3250 concrete. Concrete shall have two percent (2%) calcium chloride additive by weight and shall be placed in accordance with the requirements of Section 302-6 of the Standard Specifications.

The use of calcium chloride additive shall not be used for concrete containing any reinforcing metal.

The Contractor shall use Type III cement (High Early Strength) in accordance with Section 201-1.1.1 of the Standard Specifications for driveway and alley approaches, cross gutters and alley centerline gutters.

PCC improvements shall be constructed in accordance with the requirements above, and the following requirements:

A. The City will mark the removal area at each location.

B. Score lines shall match adjacent markings.

C. The Contractor shall trim or cut and remove all interfering tree roots under the supervision of the Recreation and Parks Department.

D. The Contractor will be responsible for all markings on newly laid concrete. (The City Engineer may require removal and reconstruction of marked or damaged work).

## 3-05 SHOP DRAWINGS AND SUBMITTALS

The Contractor shall submit shop drawings for all project materials. Each submittal must be clean, legible and easy to follow, including, but not limited to the following items in accordance with Section 2-5.3 “Shop Drawings and Submittals” of the Standard Specifications:

A. Pipe Material and Certificate of Compliance

B. All Valves

C. Fire Hydrants

D. Asphalt Concrete Mix

E. Portland Cement Concrete Mix

F. Asphalt Concrete Pavement

G. Traffic Signal Loop Detectors

H. Thermoplastic Material

I. Line Stops

J. Service Lateral Piping

As a part of the above-required shop drawing submittal the Contractor shall include the following:

A. The Contractor shall submit completed material lists for the work of this section. Such lists shall state manufacturer and brand name of each item or class of material. The Contractor shall also submit shop drawings for all grounding work not specifically shown.

B. Shop Drawings shall provide sufficient information to evaluate the suitability of the proposed material or equipment for the intended use, and for compliance with these specifications.

C. All Contractor submittals shall be carefully reviewed against the contract documents by an authorized representative of the Contractor, prior to submittal to the Engineer. A letter shall be included with each submittal stating the contract documents have been reviewed and the submitted product is correct for the project application and in strict conformance with the contract documents. The letter affidavit must be dated and signed by both the Contractor and the product manufacturer or service provider. In the case of shop drawings, each sheet shall be so dated and signed for approval. No consideration for review by the Engineer of any Contractor submittals will be made for any items which are not accompanied by affidavit by the Contractor. All submittals without an affidavit will be returned to the Contractor without action taken by the Engineer, and any delays caused thereby shall be the total responsibility of the Contractor.

D. The Engineer's review of Contractor submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimensions. The Contractor shall assume all responsibility and risk for any misfits due to any errors in Contractor submittals. The Contractor shall be responsible for the dimensions and the design of adequate connections and details.

## 3-06 QUALITY ASSURANCE

A. Field control of Location and Arrangement: The drawings diagrammatically indicate the desired location and arrangement of piping, conduit runs, equipment and other items. Exact locations shall be determined by the Contractor in the field based on the physical size and arrangement of equipment, finished elevations, and other obstructions. Locations shown on the Drawing, however, shall be adhered to as closely as possible.

B. Workmanship: All materials and equipment shall be installed in accordance with printed recommendations of the manufacturer that have been reviewed by the City Engineer. The installation shall be accomplished by workmen skilled in this type of work and installation shall be coordinated in the field with other trades so that interferences are avoided.

C. All work, including installation, connection, calibration, testing and adjustment, shall be accomplished by qualified, experienced personnel working under continuous, competent supervision. The completed installation shall display component work, reflecting adherence to prevailing industrial standards and methods.

D. Protection of Equipment and Materials: The Contractor shall provide adequate means for and shall fully protect all finished parts of the materials and equipment against damage from any cause during the progress of the work and until acceptable by the City Engineer.

E. All materials and equipment, both in storage and during construction, shall be covered in such a manner that no finished surfaces will be damaged, marred, or splattered with water, foam, plaster, or paint. All moving parts shall be kept clean and dry.

F. The Contractor shall replace or have refinished by the manufacturer, all damaged materials or equipment at no expense to the Owner.

G. Tests: The Contractor shall make all tests required by the City Engineer or other authorities having jurisdictions. All such tests shall be performed in the presence of the City Engineer. Certification of instrument calibration shall be submitted to the City and Metro for approval and acceptance. The Contractor shall furnish all necessary testing equipment and pay all costs of tests, including all replacement parts and labor necessary due to damage resulting from damaged equipment or from test and correction of faulty installation.

H. Standard test reports for mass-produced equipment shall be submitted along with the shop drawing for such equipment. Test reports on testing specifically required for individual pieces of equipment shall be submitted to the City Engineer and Metro for review prior to final acceptance of the project.

I. Any test failure shall be corrected in a manner satisfactory to the City Engineer at no additional cost to the City.

## 3-07 ASPHALTIC CONCRETE PAVEMENT

**3-07.1 GENERAL -**The asphaltic concrete pavement shall be placed in accordance with the typical sections shown on the plans.

**3-07.2 MATERIAL -**Asphalt concrete to be placed shall conform to the requirements of Section 203-6 of the Standard Specifications. AC wearing surface course shall be in accordance with the surfaces as per City of Beverly Hill Standard Drawings BH114 and BH 710. All hot tack coated surfaces must be covered at end of each day's work.

**3-07.3 CONSTRUCTION DETAILS -** Asphalt concrete material shall be laid in accordance with the requirements of Section 302-5 of the Standard Specifications.

## 3-08 PRUNING TREE ROOTS

The Contractor shall remove interfering tree roots in accordance with the following:

Tree roots shall be severed cleanly by using a speed saw and/or ax only. The use of a backhoe shall not be permitted to pull the tree roots. Tree root cuts shall be kept moist and covered with burlap to maximize protection.

The Recreation and Parks Inspector shall be notified prior to the removal of roots 4 inches in diameter or larger.

## 3-09 THERMOPLASTIC TRAFFIC STRIPING AND PAVEMENT MARKINGS

The Contractor shall refer to Appendix C for street stripping repair and replacement.

**3-09.1 MATERIALS -**The thermoplastic material shall conform to State Specification 8010-21C-19. Materials shall be of the "ALKYD" type. "HYDRO CARBON" material types will not be accepted. Glass beads to be applied to the surface of the molten thermoplastic material shall conform to the requirements of State Specification 8010-11E-22 (Type II).

State Specifications for thermoplastic material and glass beads may be obtained from the Transportation Laboratory, P.O. Box 19128, Sacramento, CA 95819, Telephone No. (916) 739-2400.

**3-09.2 APPLICATION** - Existing surfacing which is to receive the thermoplastic material shall be mechanically wire brushed to remove all dirt and contaminants. Surfaces of new Portland cement concrete pavement to receive the thermoplastic material shall be mechanically wire brushed or abrasive blast cleaned to remove all laitance and curing compound.

Existing pavement markers which are damaged by blast cleaning or wire brushing shall be removed and replaced by the Contractor at his expense.

Thermoplastic material shall be applied only to dry pavement surfaces and only when the pavement surface temperature is above 50 degrees Fahrenheit.

A primer, of the type recommended by the manufacturer of the thermoplastic material, shall be applied to all asphaltic surfaces over 6 months old and to all Portland cement concrete surfaces. The primer shall be applied immediately in advance of, but concurrent with, the application of thermoplastic material. The primer shall be applied at the application rate recommended by the manufacturer and shall not be thinned.

Preheaters with mixers having 360-degree rotation shall be used to preheat material. The

thermoplastic material shall be applied to the pavement at a temperature between 400 degrees Fahrenheit and 425 degrees Fahrenheit unless a different temperature is recommended by the manufacturer.

The thermoplastic material shall be applied by either spray or extrusion methods in a single uniform layer.

Stencils shall be used when applying thermoplastic material for pavement markings.

The pavement surface to which thermoplastic material is applied shall be completely coated by the material and the voids of the pavement surface shall be filled.

Unless otherwise specified in the special provisions, the thermoplastic material for traffic stripes shall be applied at a minimum thickness of 0.060-inch. Thermoplastic material for pavement markings shall be applied at a thickness of 0.100-to 0.150-inch. Glass beads shall be applied immediately to the surface of the molten thermoplastic material at a rate of not less than 8 pounds per 100 square feet. The amount of glass beads applied shall be measured by stabbing the glass bead tank with a calibrated rod.

**All drips, smudges and overpour shall be corrected immediately.**

## 3-10 TRAFFIC SIGNAL LOOP DETECTORS

**3-10.1 VEHICLE DETECTORS –** Inductive-loop detectors shall be used.

**3-10.2 CONSTRUCTION MATERIALS -** Detector lead-in cable shall be four pair polyethylene insulated, individually twisted, individually shielded, filled (water-blocked), black high density polyethylene jacketed, with 300 volt dielectric rating.

The number of pairs in the detector lead-in cable shall be determined by meeting the requirements that there shall be a maximum of two detectors per pair of channel for presence or call detector loops, and one detector per pair or channel for advance loops.

**Conductor:** #18 AWG 7/26 stranded tinned copper per ASTM B-286.

**Insulation:** High-density polyethylene compound which meets the requirements of ASTM D-1248, Type III, Class A, Category 5, Grade E-8, with a .013" nominal wall thickness.

**Twist Shield and Drain:** The insulated conductors shall be twisted into pairs with a lay not to exceed six inches. Each pair helically applied alum/mylar with #20-7/28 TC drain under shield.

**Cable Assembly:** The shielded pairs shall be assembled to form a substantially cylindrical core.

**Fill:** All interstices shall be "Water-Blocked" with an Amorphous Jelly Compound.

**Shield:** A longitudinally applied aluminum mylar shield shall be applied over the filled core with an overlap.

**Jacket:** Black high-density polyethylene jacketing grade compound with a .030" minimum wall thickness.

**Electrical Characteristics:** Voltage rating - 300 volts minimum; mutual capacitance 27 picofarads per foot, 10%.

**Color Code:**

Two Pair -Blue/white and orange/white;
Three Pair -Blue/white, orange/white, and green/white;
Four Pair -Blue/white, orange/white, green/white, and brown/white.

Each cable shall be identified by the installation of a rigid plastic tag held in place by two nylon ties.

**3-10.4 INSTALLATION DETAILS -**Inductive loop detectors shall be 6-foot diameter circular loops. Slots for the loops shall be core drilled with a 6-foot diameter core bit or other method approved by the City Engineer. No holes for anchoring a router or flat saw to perform the cut will be accepted. All slots shall be vertical with a maximum width of 1/2-inch, cut to a minimum depth of 4-inches. In no case shall any cut exceed the depth of the existing pavement.

All cuts shall be washed clean. Water and slurry shall be vacuumed out or blown dry with compressed air, leaving a clean and dry loop area.

A 6-foot diameter loop consisting of 3 turns of Detecta Duct or Type 2 loop wire stacked one wire on top of another shall be installed in slot. A prewound loop wire shall be used in slots greater than 1/4-inch in width. **Loops shall be installed on the same day in which loop slots are cut.**

All slots shall be filled with hot melt rubberized asphalt sealant in accordance with the provisions in Section 86-5.01A, Installation Details of the State Specifications and the City of Beverly Hills Standard Plan BH1-5.

Sawcut homerun to the appropriate pull box within 50 feet. The homerun slot shall be 1/4 inch in width and 4 inches in depth. The homerun of the loop shall be twisted clockwise (at least 2 turns per foot) into a pair, numbered, and identified in the pull box. If the stub-out excavation area adjacent to the gutter for loop homeruns is greater than 6” in diameter, it shall be backfilled with asphalt concrete. If excavation area is less than 6” in diameter, seal area with hot melt rubberized asphalt sealant.

All lead-ins shall enter the pull box and shall be numbered and identified in accordance to the Round Inductive Loop Installation Detail BH1-5 in these specifications.

New 2-inch GRS conduits stub outs between pull box and loop detector hand hole shall be installed when noted on the plans. Compensation for all materials and work shall be included in the bid price for loops.

All installations of Traffic Signal Loop detector cable shall conform to the City of Beverly Hills Public Works Department detail and Standard Specifications for Public Works

Construction.

The Contractor shall obtain approval for exact loop location prior to final placement, and shall perform preliminary striping layout prior to loop detector layout. Loop detectors shall be 6' round with 9' spacing between adjacent loops in the same lane, except as noted on the plans. Center loops in the traveled portion of the lane, and extend limit line loops 1' from the limit line, except as shown on the plans.

## 3-11 PAVEMENT MARKERS

Pavement markers shall conform to the State Standard Plans and Standard Specifications, Section 84 and 85, "Pavement Markers", July 1992, except as noted on the Plans and in these Special Provisions.

Cost for removing, furnishing and installing reflective, non-reflective, and two-way blue reflective pavement markers shall be considered as included in the unit price bid for "Striping" and no additional compensation shall be allowed therefore.

## 3-12 DUCTILE IRON PIPE

Ductile-iron pipe shall be Class 52 manufactured per AWWA C111, C115, C150, and C151 and shall be installed per AWWA C600.

Ductile-iron pipe shall be provided in standard 5.49m (18’) or 6.10m (20’) lengths unless otherwise detailed or required on the Approved Plans. When deep trenches or shoring restrictions hinder the use of the standard length sections, shorter lengths shall be allowed with the concurrence of the City Engineer. Random lengths are not allowed.

The minimum length of ductile-iron pipe sections used for tie-ins and stub-outs shall be three (3) times the nominal pipe diameter or 1200mm (48”), whichever is longer, unless otherwise approved by the District Engineer.

Joints for ductile-iron pipe shall be mechanical, flanged, or push-on in accordance with AWWA C110, C111, and C153, unless otherwise indicated on the Approved Plans. Joints that are aboveground, within structures, or submerged shall be flanged unless otherwise shown on the Approved Plans.

Except as amended herein, or otherwise shown on the Approved Plans, joints for ductile-iron pipe shall have a pressure rating equal to or greater than the adjacent piping.

Horizontal Radius and Pipe Deflections: In locations where it is required to lay ductile-iron pipe along curves or install pipe deflections, ductile-iron pipe shall be deflected at joints in accordance with the requirements of AWWA C600 and no more than 80% the manufacturer’s recommendations.

Plain ends of ductile-iron pipe shall conform to the requirements of AWWA C151 to accept mechanical or push-on joints, flanged coupling adaptors, flexible couplings, or grooved couplings.

All ductile-iron pipe shall be cement-mortar lined, **double thickness**, with seal coat in accordance with AWWA C104.Cement-mortar shall be in accordance with ASTM C 150, Type II or Type V.

Ductile-iron fittings shall be manufactured per AWWA C110 and C153. Gray-iron or cast-iron fittings shall not be used. Gray iron or cast-iron flanges shall not be used.

Ductile-iron fittings shall be mechanical, flanged, or push-on joints in accordance with AWWA C110, and C153.

Except as amended herein, or otherwise shown on the Approved Plans, joints for ductile-iron fittings shall have a pressure rating equal to or greater than the adjacent piping.

Unless otherwise specified, ductile-iron flanged fittings shall be integrally cast in accordance with AWWA C110, rated at a working pressure of 1,724 KPa (250 psi). Gray-iron or cast-iron flanged fittings are not permitted.

The exterior surfaces of all ductile-iron fittings shall be factory-coated with a minimum one (1) mil thick petroleum asphaltic material per AWWA C110 and C153.

All ductile-iron fittings shall be cement-mortar lined and seal-coated in accordance with AWWA C104. Cement-mortar shall be in accordance with ASTM C 150, Type II or Type V.
All materials in contact with water shall be certified to meet the requirements of ANSI/NSF Standard 61. Push-on pipe and fittings shall be TYTON as manufactured by U.S. Pipe, or approved equal.

Where the plans call for “Fully Restrained Pipe,” restrained push-on gaskets or mechanical joint pipe and fittings shall be utilized. Restrained joints shall be designed for a minimum water working pressure of 250 psi. Restraint shall be accomplished by utilizing Field-Lok gaskets, EBAA Iron joint restraints with Mega-Bond coating, or a restrained joint and fitting system such as TR-Flex, or approved equal. Refer to Specification Section 3-21.

### 3-12.1 PIPE JOINT LUBRICANT

All pipe lubricant shall be suitable for municipal potable water systems and certified compliant with NSF/ANSI 61 and Annex G, NSF14 and Drinking Water System Components-Health effects, in addition to the requirements of the Safe Drinking Water Act.

The pipe lubricant shall be formulated to prevent turbidity, taste, and odor problems and shall not promote bacterial growth in new main installations.

The lubricant shall be safe for the use with metal or plastic rubber gasketed pipe.

The consistency shall be smooth and must remain a paste at temperatures above 150°F (66° C). The temperature range for use shall be 7°F (-14° C) to 150°F (66° C).

The lubricant shall be non-corrosive and nonflammable and shall not swell rubber gaskets.

Provide Affidavit of Compliance per submittal requirements.

### 3-12.2 POLYETHYLENE ENCASEMENT

Polyethylene encasement shall be used for all ferrous metal materials that are not coated with epoxy or cement mortar.

A. Polyethylene wrap or sleeves shall be used for the protection of buried ductile-iron pipe, appurtenances, and valves.

B. Polyethylene sleeves shall be used for the protection of buried ductile iron pipe and fittings. Where the use of a sleeve is not practical, the fittings may be wrapped. Additionally, all bolted connections shall be coated with wax tape.

C. Polyethylene wrap or sleeves may also be installed around buried PVC pipe for recycled water identification.

D. Polyethylene encasement shall be as indicated below and shall be selected from the Approved Materials List. Polyethylene materials shall be kept out of direct sunlight exposure.

1. Polyethylene wrap and sleeves shall be a minimum 0.008" thick linear low density polyethylene film in accordance with AWWA C105.

2. Polyethylene wrap and sleeves shall be clear for use with potable water and purple for use with recycled water.

3. Polyethylene or vinyl adhesive tape a minimum of 2" wide or plastic tie straps shall be used to secure polyethylene encasement.

4. Polyethylene wrap and sleeves shall be clear for use with potable water and purple for use with recycled water.

5. Installation Methods and shall comply with AWWA C105. Method A is preferred.

6. Polyethylene encasement shall be secured with 50mm (2”) wide polyethylene or vinyl adhesive tape or with plastic tie straps.

E. Provide Affidavit of Compliance per submittal requirements.

### 3-12.3 WARNING/IDENTIFICATION TAPE

Warning/identification tape shall be used to identify location of underground utilities and to act as a warning against accidental excavations of buried utilities. Warning identification tape shall be used on all underground water and recycled water mains, potable and recycled water irrigation systems, sewer mains, and all related appurtenances. Warning/identification tape shall also be used on cathodic protection wiring systems and tracer wire brought into and out of access ports.

Warning/identification tape shall be as indicated below and in accordance with the Approved Materials List.

1. Tape shall be an inert, non-metallic plastic film formulated for prolonged underground use that will not degrade when exposed to alkalis, acids and other destructive substances commonly found in soil.

2. Tape shall be puncture-resistant and shall have an elongation of two times its original length before parting.

3. Tape shall be colored to identify the type of utility intended for identification. Printed message and tape color shall be as follows:

| Printed Message | Tape Color |
|---|---|
| Caution: Potable Waterline Buried Below | Blue |
| Caution: Recycled Waterline Buried Below | Purple |
| Caution: Sewerline Buried Line | Green |
| Caution: Cathodic Protection Cable Buried Below | Red |
| Caution: Electric Line Buried Below | Red |

   Ink used to print messages shall be permanently fixed to tape and shall be black in color with message printed continuously throughout.

4. Tape shall be minimum 0.102mm (0.004” or 4 mil) thick x 150mm (6") wide with a printed message on one side. Tape used with the installation of onsite potable and recycled water irrigation systems shall be a minimum of 75mm (3”) wide.

Provide Affidavit of Compliance per submittal requirement.

## 3-13 BUTTERFLY VALVES

Butterfly valves specified herein shall conform to the latest edition of AWWA C504 short body valves. Unless otherwise specified in the plans, valves shall be suitable for a maximum steady-state fluid working pressure of 150 psig. Valves shall be bubble-tight at the rated pressure class in either direction, and shall be satisfactory for applications involving throttling service and for applications requiring valve actuation after long periods of inactivity. Valve discs shall rotate 90 degrees from the full open position to the tight shut position. All bolts and accessories shall be Type 316 stainless steel. The resilient valve seat shall be secured either to the valve disc or the valve body.

End Connections: Valves adjacent to fittings shall be flanged, flanged by push-on, or flanged by mechanical joint.

Shaft: The shaft shall be of one-piece construction of Type 316 stainless steel.

Bearings: The shaft bearings shall be corrosion-resistant and self-lubricating, made of Type 316 stainless steel backed with TFE, or Type 316 stainless steel.
Packing: The shaft packing shall be adjustable and field-replaceable of TFE chevron type design or PTFE V-flex style.

Buried Operators: Buried operators shall be of the traveling nut type, sealed, gasketed, and lubricated for underground service, and provided with a 2-inch square operating nut. Operator shall be capable of withstanding an overload input torque of 450 ft-lbs at full-open or full-closed position without damage to the valve operator. Actuators shall allow for positive throttling and locking in any position between open and closed.

Disc: The valve disc shall be constructed from high strength cast iron ASTM A-126, or high strength ductile iron ASTM A-536. Disc and shaft connection shall be made with stainless steel pins.

Testing: Factory hydrostatic and leakage tests shall be conducted in strict accordance with AWWA Standard C504.

Coating: Valve interior and exterior surfaces shall be coated with a polyamide cured epoxy, factory applied over a sand blasted “new white metal surface” per SSPC-SP10, to a minimum thickness of 10 mils, in accordance with AWWA C-550.

Henry Pratt "Groundhog" for Class 150 valves or "Triton HP-250" for Class 250 valves.

DeZurik AWWA Butterfly Valves (BAW) for Class 150 or Class 250 valves.

Mueller "Lineseal III" for Class 150 valves or "Lineseal XP" for Class 250 valves.

## 3-14 EXTENSION STEMS FOR BURIED VALVE OPERATORS

Where the depth of the valve is such that its operating nut is more than 3 feet below grade, provide operating extension stems to bring the operating nut to a point between 24 to 36 inches below the surface of the ground and/or box cover. Extension stems shall be steel, and shall be complete with 2-inch square operating nut. Provide stem with a 1/8-inch center guide to keep stem centered.

## 3-15 COMBINATION AIR VALVES

Combination Air Valves shall be of the single housing style that combines the operating features of both an Air/Vacuum and Air Release Valve. The Air/Vacuum portion shall automatically exhaust large quantities of air during the filling of the pipeline and automatically allows air to re-enter the pipeline when the internal pressure of the pipeline approaches a negative value. The Air Release portion shall automatically release small pockets of air from the pipeline while the pipeline is in operation and under pressure.

The Combination Air Valves shall have threaded inlet and outlet connections and be designed for a water working pressure of 150 psi. Valve bodies, covers, and lever frames shall be constructed of cast iron. Needle and seat shall be Buna-N synthetic rubber. Float and all other trim shall be 316 stainless steel.

Valves shall be Val-Matic Series 200, Dezurik/APCO Series 140C, or approved equal.

## 3-16 FIRE HYDRANTS

**3-16.1 FIRE HYDRANT INSTALLATION IN BEVERLY HILLS -** Fire hydrants within the City of Beverly Hills shall be installed in accordance with the current Beverly Hills Standard Drawings and Specifications for Construction of Water Pipeline Installations.

## 3-17 NO LEAD BRASS FITTINGS AND VALVES

All brass valves and fittings for service lines shall be provided under this contract.

A. All fittings and valves shall be manufactured in accordance with AWWA Standard C-800, latest revision, and as further specified in these technical specifications.

   1. Exception: Any brass part of the fitting or valve in contact with potable water shall be made of a “No-Lead Brass”, defined for this specification as UNS Copper Alloy No. C89520 or C89833 in accordance with the chemical and mechanical requirements of ASTM B584 and AWWA C-800. This “No-Lead Brass” alloy shall not contain more than nine one hundredths of one percent (0.09% or less) total lead content by weight.

2. Any Brass part of the fitting or valve **not** in contact with potable water shall be made of 85-5-5- 5 brass as defined for this specification as UNS Copper Alloy C83600 per ASTM B62, ASTM B584 and AWWA C-800.

B. All brass fittings and valves shall be certified by an ANSI accredited test lab per NSF/ANSI Standard 61, Drinking Water Components – Health Effects, Section 8 or NSF/ANSI Standard 372, Drinking Water System Components – Lead Content. Proof of certification is required.

C. Brass fittings and valves shall comply with the United States Of America Safe Drinking Water Act, and the U.S. Environmental Protection Agency.

D. All brass fittings and valves shall have the manufacturers name or trademark permanently stamped or cast on it. Another marking identifying the “no lead” brass alloy, e.g., ‘NL’, shall be cast or permanently stamped on the fitting or valve.

E. An affidavit certifying compliance with these standards and specifications shall be signed and submitted by the manufacturing firm’s Quality Assurance or Engineering Manager.

F. The brass fittings and valves shall be produced by a manufacturer in the United States of America or Canada.

### 3-17.1 CORPORATION BALL VALVE

Corporation stop shall be a ball-type valve with straight through design, double O-ring stem seals, PTFE coated ball, 300-psi maximum working pressure, with iron pipe inlet threads (AWWA “IP”), and conductive compression connection outlet for CTS O.D. tubing (Mueller 110). Valve shall be Mueller B-25028-N, or approved equal.

### 3-17.2 CURB STOP

Curb stop shall be a ball-type valve constructed of  with straight through design, double O-ring stem seals, PTFE coated ball, 300-psi maximum working pressure, with conductive compression connection inlet and outlet for CTS O.D. tubing (Mueller 110), except where shown otherwise in the plans, or where other end connections are required to connect to adjacent equipment. Valve shall be Mueller B25209-N, or approved equal.

### 3-17.3 ANGLE METER STOP

Angle meter stop shall be a ball-type valve constructed with double O-ring stem seals, quarter turn check lock wing, PTFE coated ball, 300-psi maximum working pressure, with conductive compression connection inlet for CTS O.D. tubing (Mueller 110), meter swivel nut outlet. Valve shall be Mueller B-24258-N (1-inch), B-24276-N (2-inch), or approved equal.

### 3-17.4 COPPER PIPE AND TUBING

Copper pipe and tubing shall meet the requirements of ASTM B 88, be cylindrical, of uniform wall thickness, and free from any cracks, seams, or other defects. Piping located above floors or suspended from ceilings shall be Type “L” hard. Piping buried or located beneath floor slab shall be Type “K” soft. Copper tubing shall be joined using Mueller 110 Compression Connection Series fittings, or approved equal. No soldered or flared joints are permitted.

### 3-18 METER BOXES AND VAULTS

All meter boxes installed in alleys, roadways, driveways, or called out as traffic rated on the plans, shall be H-20 traffic rated. Meter boxes installed behind curbs or within sidewalks shall be non-traffic rated, unless called out as traffic rated in the plans.

### 3-18.1 1-INCH AND 2-INCH SERVICES

A. Traffic Rated

1. Meter boxes shall be reinforced concrete, provided with fabricated black steel checker plate covers with heavy duty 7”x13” polymer concrete reader lids, rated for AASHTO H-20 loading, and suitable for installation within roadways and alleyways. Meter boxes for services smaller than 1-inch shall be Christy/Oldcastle Precast B1017BOX (Caltrans No. 3-1/2T traffic box), with modified cover B1017-51E-BH Logo.

2. Meter boxes for 1, 1.5, or 2-inch services shall be Christy/Oldcastle Precast B1324BOX (Caltrans No. 5T traffic box), with modified cover B1324-51E-BH Logo. The contractor and inspector shall field verify the appropriate use of this size box.

3. Meter boxes and covers for 2-inch services shall be Christy/Oldcastle Precast B1730BOX (Caltrans No. 6T traffic box), with modified cover B1730-51E –BH Logo.

4. Reading lids shall be fabricated with the Beverly Hills logo as shown in Appendix E.

5. Boxes shall be encased and bedded upon 6-inches of concrete per Beverly Hills standard drawing BH 2-3, and lids shall be bolted down with two (2) 3/8-inch diameter Type 316 stainless steel hex head bolts.

6. Refer to Appendix E for detailed product information and Logo information.

B. Non-Traffic Rated

Meter boxes and covers shall be constructed from heavy duty polymer concrete, rated for incidental AASHTO H-20 loading, and suitable for installation behind curbs, or within sidewalks. Meter boxes and covers for 1-inch services shall be Carson H1324-15. Meter boxes and covers for 2-inch services shall be Carson H1730-18.

Covers shall be fabricated with the Beverly Hills logo as shown in Appendix D.

### 3-18.2 3-INCH SERVICES AND LARGER

A. Traffic and Non-Traffic Rated

1. Meter vaults shall be precast concrete with galvanized steel covers, rated for AASHTO H-20 loading, and suitable for installation within alleyways, behind curbs, or within sidewalks.

2. Vaults for 3-inch services shall be 2-ft x 3-ft x 33-in deep interior dimension flat wall water vaults as manufactured by Jensen Precast.

3. Vaults for 4-inch services shall be 2.5-ft x 4-ft x 33-in deep interior dimension flat wall water vaults as manufactured by Jensen Precast.

4. Covers shall be provided with circular access opening per Beverly Hills requirements, and include the Beverly Hills logo as shown in Appendix D.

### 3-19 SLEEVED TYPE COUPLINGS

A. Sleeve type couplings include straight couplings, transition couplings, reducing couplings and flange coupling adapters and will be used to connect all combinations of ductile iron, cast iron, steel and ACP pipe.

B. All sleeve couplings shall meet the latest revision of AWWA C219 standards.

C. Center ring shall be:

1. Ductile Iron per ASTM A536, 65-45-12

2. Steel per ASTM A283 Grade C or equivalent with a minimum yield of 30,000 psi.

D. End rings shall be:

1. Ductile Iron per ASTM A536, 65-45-12.

2. Steel per ASTM A576-Grade 1020 or equivalent have a minimum

yield of 54,000 psi.

E. Coupling flanges shall have the same bolt pattern and equal or exceed pressure rating of the connecting flange. Refer to Section 2.10 for flange coupling adapter flange requirements.

F. The location and number of each type of sleeve coupling shall be determined from the construction drawings

G. The product shall be certified compliant with NSF/ANSI 61, Drinking Water System Components-Health effects, in addition to the requirements of the Safe Drinking Water Act.

H. The pipe material and nominal pipe sizes are shown on the plans and it shall be field verified prior to ordering any type of couplings.

I. All couplings shall be pressure rated for a minimum of 250 psi or the rating of the pipe (whichever is greater) and shall with operate with manufacturer guarantee at the water system design pressures.

J. The water system operating temperature range is between 32 – 150°F.

K. The minimum wall thickness of the sleeve coupling shall be ¼ inch and the minimum center sleeves length shall comply with Table 2 of AWWA C219. Manufacturer shall confirm the minimum length is sufficient for each application. Minimum lengths for reducing couplings shall be 12-inches.

L. Allowable angular pipe deflections shall not exceed 80 % of the manufacturer's recommendation and conform to Section 4.5 and Table 3 of AWWA C219.

M. Coatings thickness shall be a minimum of 16 mils of either shop applied liquid or fusion bonded epoxy in accordance with AWWA C210 or AWWA C213.

N. Gasket materials shall Buna N Grade 60 and/or exceed or meet the requirements AWWA C219 Section 4.23 and ASTM D2000.

O. Flange bolts and nuts shall conform to the requirements of Section 2.03. End ring bolts and nuts shall conform to AWWA C219 Section 4.2.4 and AWWA C111.

P. All couplings shall clearly be marked with a pressure rating per AWWA C219 Section 6.1.4.

Q. Affidavits of Compliance (Certifications) per the submittal requirements.

## 3-20 JOINT RESTRAINT SYSTEMS

Joint restraint systems shall be used for rubber ring joint pipe. Joint restraint systems shall be used in conjunction with, concrete thrust blocks unless otherwise directed. Restrained joint systems shall be wax tape coated and polyethylene encased. Contractor shall submit manufacturer produced shop drawings, calculations, and catalog data for each joint restraint systems. All products shall be installed per manufacturer's recommendations including all referenced AWWA standards.

### 3-20.1 MECHANICAL JOINT RESTRAINT DUCTILE IRON PIPE AND PVC

A. Restraint devices for joining plain end pipe to mechanical joint fittings and appurtenances shall conform to either ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A21.53. Restraint devices shall be Listed by Underwriters Laboratories (3-inch through 24-inch size) and approved by Factory Mutual (3- inch through 12-inch size).

B. Restraint devices for nominal pipe sizes 3-inch through 48-inch shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10.

C. The devices shall have a working pressure rating of 350 psi for 3-inch through 16-inch and 250 psi for 18-inch through 48-inch. Ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes.

D. Gland body, wedges, and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.

E. Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN.

F. All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of 12 mils of coats of liquid or fusion bonded thermoset epoxy coating per AWWA 210 or AWWA 213.

G. All casting bodies shall be surface pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.

H. All components shall be manufactured and assembled in the United States. The purchaser shall, with reasonable notice, have the right to plant visitation at his/her expense.

I. Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly. Manufacturer installation recommendations shall be followed.

J. Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

K. Approved Materials are EBAA Iron Inc. Megalug Series 1100 (Ductile Iron), Megalug Series 2000 (PVC), or approved equal (prior to Bid).

## 3-20.2 STRAIGHT AND TRANSITION COUPLINGS

A. Joint restraint to prevent axial separation shall be incorporated into the design of the sleeve or coupling used to connect two plain pipe ends. The working water pressure shall be rated for 250 psi minimum and all higher design pressures per Section 15000.1.06. For ductile iron pipe, the flange adapter shall have a safety factor of 2:1 minimum.

B. The restraint mechanism shall consist of a plurality of individually actuated gripping surfaces to maximize restraint capability.

C. Torque limiting twist off nuts shall be used to insure proper actuating of the restraint devices.

D. The restraint devices shall be coated with 12 mils of Fusion-Bonded Epoxy Coating (AWWA C213-07).

E. Ductile iron components shall be of a minimum of 65-45-12 ductile iron meeting the requirements of ASTM A536 of the latest revision and shall be tested in accordance with the stated standard.

F. The restrained joining system shall meet the applicable requirements of AWWA C219, ANSI/AWWA C111/A21.11, and ASTM D2000.

G. Approved Materials are EBAA Iron Inc. Megalug Series 3800 or approved equal (prior to Bid).

## 3-20.3 RESTRAINED FLANGED COUPLING ADAPTERS

A. Restrained flange adapters shall be used in lieu of threaded, or welded, flanged spool pieces. Flange adapters shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C110/A21.10.

B. Restraint for the flange adapter shall consist of a plurality of individual actuated gripping wedges to maximize restraint capability. Torque limiting actuating screws shall be used to insure proper initial set of gripping wedges.

C. The flange adapter shall be capable of deflection during assembly, or permit lengths of pipe to be field cut, to allow a minimum of 0.6” gap between the end of the pipe and the mating flange without affecting the integrity of the seal.

D. For PVC pipe, the flange adapter will have a pressure rating equal to the pipe.

E. The restraint shall be manufactured of ductile iron conforming to ASTM A536 and rated for a minimum of 250 psi and all higher design pressures per Section 15000.1.06. For ductile iron pipe, the flange adapter shall have a safety factor of 2:1 minimum.

F. The restraint devices shall be coated with liquid or fusion bonded epoxy per AWWA C210 or AWWA C213.

G. Approved Materials are EBAA Iron Inc. Megalug Series 2100 or approved equal (prior to Bid).

**3-20.4 COUPLING RESTRAINER FOR ASBESTOS PIPE**

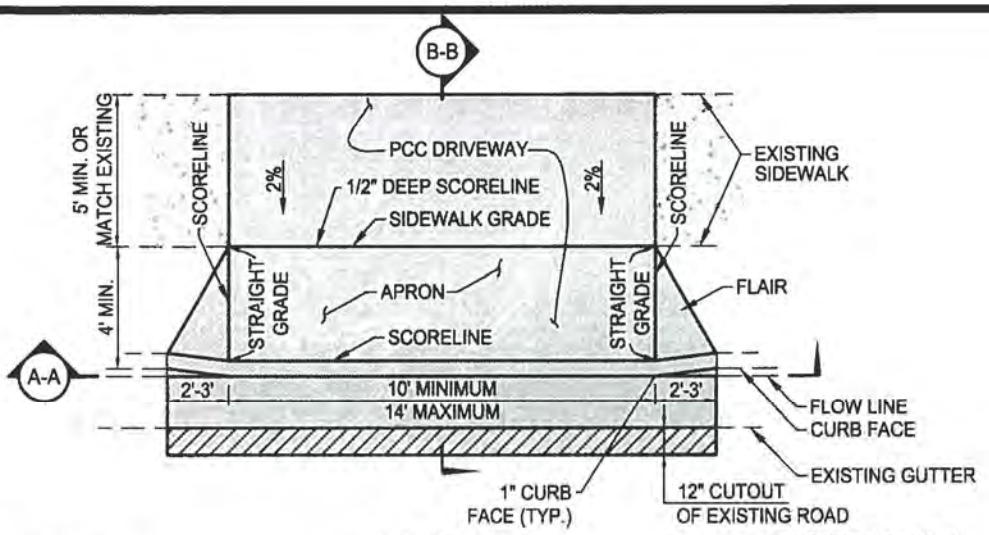
Restrainer for use over A/C coupling, MJ Couplings, and mechanical couplings use JCM Industries model JCM 631ACP/DIP RESTRAINED COUPLING.

**3-20.5 PROVIDE AFFIDAVIT OF COMPLIANCE FOR ALL RESTRAINING DEVICES PER SUBMITTAL REQUIREMENTS.**

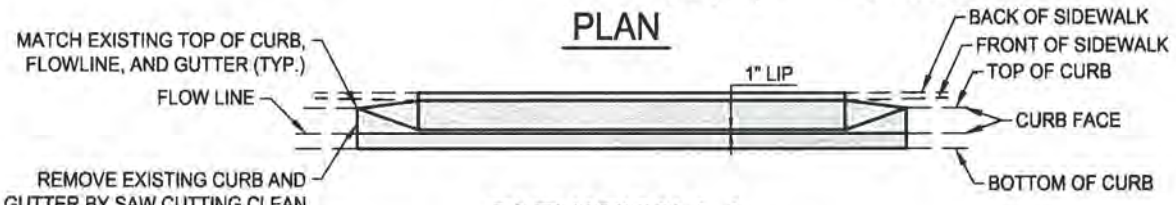
# APPENDIX A

# Section I

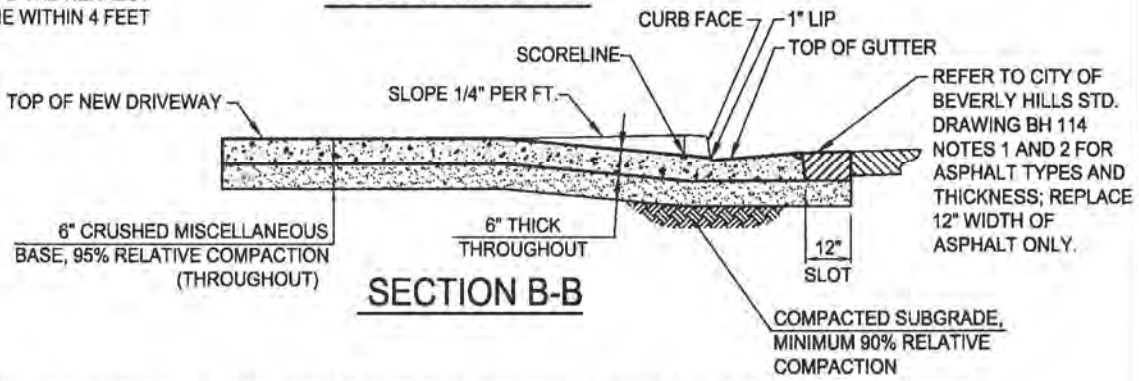
## Street Improvements




## PLAN




## ELEVATION A-A




## SECTION B-B

NOTES:

1. **DRIVEWAY APPROACH, INCLUDING SIDEWALK SHALL BE CLASS 520-C-2500 PCC MONOLITHIC POUR.**
2. ANY EXISTING TRAFFIC OR ELECTRICAL BOXES SHALL BE RELOCATED OUTSIDE OF DRIVEWAY APPROACH.
3. NO PORTION OF A PROPOSED DRIVEWAY APPROACH SHALL BE CONSTRUCTED CLOSER THAN TEN (10) FEET FROM THE CENTER OF ANY CITY TREE WITHOUT A WRITTEN APPROVAL OF THE CITY ARBORIST.
4. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
5. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

NOT TO SCALE

# RESIDENTIAL DRIVEWAY APPROACH

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| 1 | 11/4/2010 | NO JOINT BETWEEN CURB AND GUTTER |
| | | |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

STANDARD DRAWING

**BH 101**

SHEET 1 OF 2

**CITY OF BEVERLY HILLS**
**RESIDENTIAL DRIVEWAY APPROACH SPECIFICATIONS AND GENERAL REQUIREMENTS**
**IN REFERENCE TO BEVERLY HILLS MUNICIPAL CODE SEC. 8-4-4**

**Definition:** An approach is located between the edge of the gutter and property line. It is composed of an apron and flairs (see sheet 1 of 2).

1. Any variation from this Driveway Approach Standard must be approved in writing by the City Director of Public Works or his designee. Permits are required for all activities on public right-of-way.

2. **Proposal Plan:** A drawing shall be provided by the applicant to include: Width of proposed apron(s), width of proposed transitional flair areas at side of apron(s), measurement to nearest trees, street lights, other curb cuts, location of property line extension at each side of the site, location of any adjacent neighboring approach, height of the street curb in front of the property, width of the sidewalk, width of the parkway (landscaped area) and any other useful information.
Note: If the project is part of a work to be performed on a private property, the drawing submitted must be stamped with the approval of the Building and Safety Department prior to issuance of an Engineering Driveway Approach permit.

3. **Location:** No portion of a driveway approach shall be closer than three feet (3') from any lighting standard, public utility, another driveway, or other device erected in the parkway. Except in single family residential zones, driveway approaches are restricted to access which lead directly to a carport, garage, or parking area located beyond the setback area. Two (2) driveway approaches authorized for any lot or parcel shall not be less than twenty eight feet (28') apart, and each such driveway approach shall be a minimum of two feet (2') from the side property line as measured at the beginning of the full height curb. Any circular driveway shall have a minimum outer radius of twenty six (26') feet. The transportation/engineering official may approve a driveway approach closer to the side property line, or closer to any tree, lighting standard, public utility, another driveway or a device erected in the parkway where necessary to accommodate existing topography or nonremovable objects, such as buildings, walls, trees, or natural rock outcroppings. No portion of a proposed driveway approach shall be constructed closer than ten (10) feet from the center of any city tree without written approval of the City Aborist.

4. **Concrete Finish:** Approaches shall have a wood float, rotor finish. Sidewalk and curb face shall be troweled and light broom finished. Broken or defective public sidewalk, curb, and gutter adjacent to approaches shall be replaced if found necessary during the inspection of the work by Public Works inspectors.

5. **Adjacent Approach:** No raised curb will be permitted between two approaches which are adjacent to a common property line and less than 4 feet apart. The approaches shall be continuous. A written consent of adjacent property owner is required to construct a joint approach. Construction of a joint approach includes the removal of the existing adjacent approach and reconstruction of the entire shared approach.

6. **Width:** The maximum overall width of any residential driveway approach shall not exceed twenty feet (20'), and the maximum width of two (2) adjacent residential driveway approaches which are combined shall not exceed twenty six feet (26'). The minimum overall width of any driveway approach shall be sixteen feet (16'). The transportation/engineering official may approve driveway approaches which vary from the widths designated herein to accommodate existing topography, or nonremovable objects, such as buildings, walls, trees, or natural rock outcroppings. Driveway approach widths shall be the transition distance, measured along the curb, from the full height curb on one side to on the opposite side.

**Number:** Only one driveway approach shall be permitted in any residential zone on any lot or parcel with less than seventy five feet (75') of frontage, or with a front setback of less than twenty five feet (25'); with the exception that a circular driveway requiring two (2) driveway approaches shall be permitted where the parcel frontage is within four percent (4%) of the seventy five feet (75') minimum required for two (2) driveway approaches, and further, that no other deviation from the provisions of this code or discretionary action is required for such circular driveway.

7. **Materials and Workmanship:** Shall fully comply with the requirements of the "Standard Specifications for Public Works Construction", ("Greenbook"), latest edition, sections 201-1 and 303-5 respectively.

# RESIDENTIAL DRIVEWAY APPROACH

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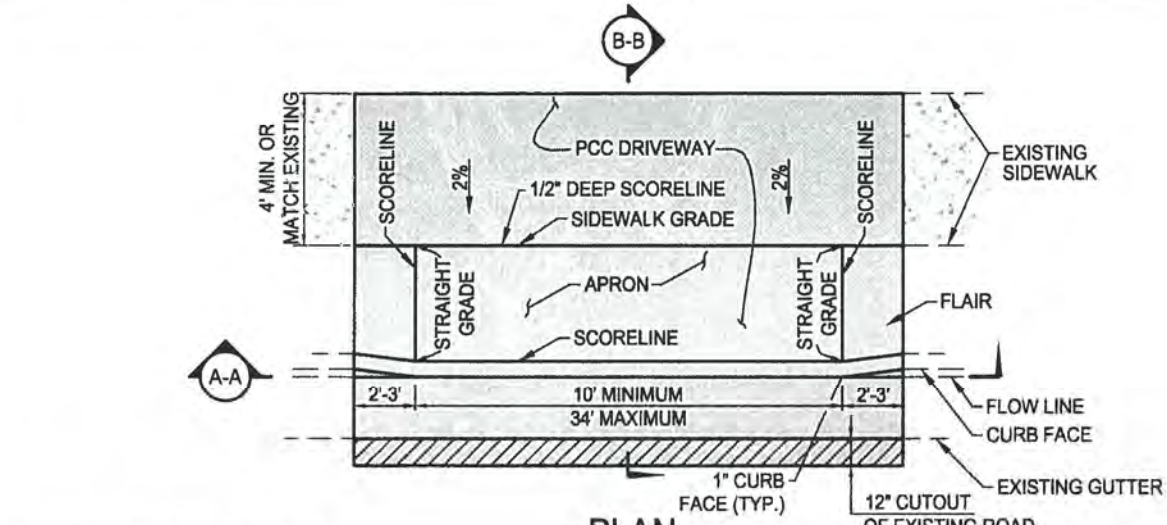
**CITY OF BEVERLY HILLS, CALIFORNIA**
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

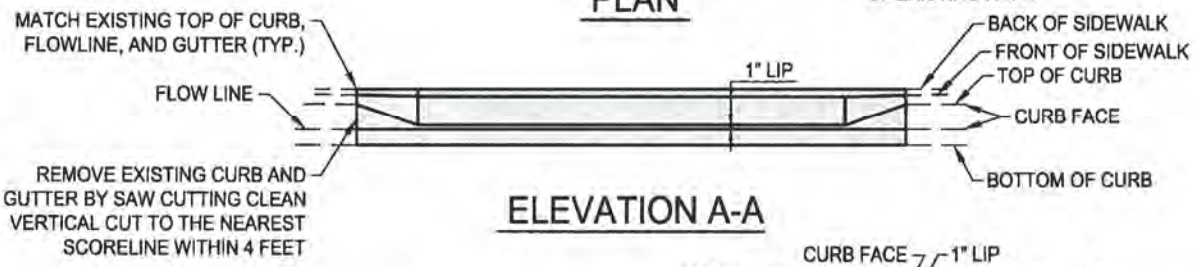
RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

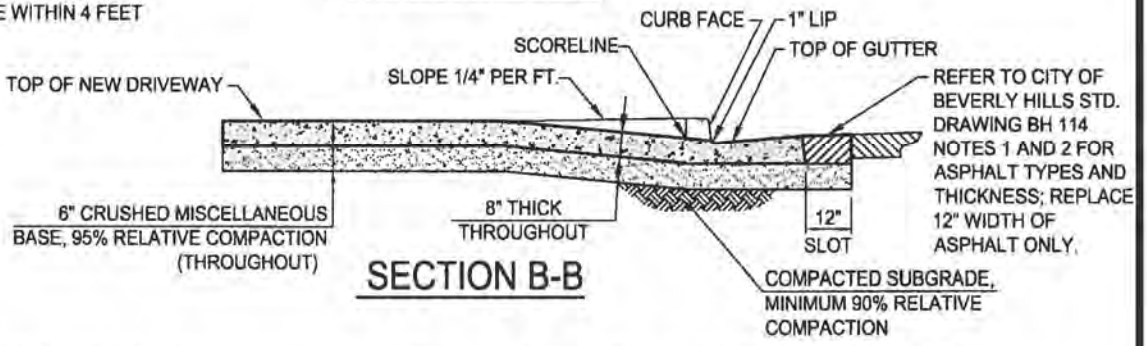
STANDARD DRAWING
**BH 101**
SHEET 2 OF 2




PLAN




ELEVATION A-A




SECTION B-B

NOTES:

1. **DRIVEWAY APPROACH, INCLUDING SIDEWALK SHALL BE CLASS 520-C-2500 PCC MONOLITHIC POUR.**
2. ANY EXISTING TRAFFIC OR ELECTRICAL BOXES SHALL BE RELOCATED OUTSIDE OF DRIVEWAY APPROACH.
3. NO PORTION OF A PROPOSED DRIVEWAY APPROACH SHALL BE CONSTRUCTED CLOSER THAN TEN (10) FEET FROM THE CENTER OF ANY CITY TREE WITHOUT A WRITTEN APPROVAL OF THE CITY ARBORIST.
4. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION. ("GREENBOOK")
5. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

NOT TO SCALE

# NON-RESIDENTIAL DRIVEWAY APPROACH

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**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ DATE 11-18-10
CITY ENGINEER

APPROVED _____ DATE 11-18-10
PUBLIC WORKS DIRECTOR

STANDARD DRAWING
**BH 102**
SHEET 1 OF 2

**CITY OF BEVERLY HILLS**
**NON-RESIDENTIAL DRIVEWAY APPROACH SPECIFICATIONS AND GENERAL REQUIREMENTS**
**IN REFERENCE TO BEVERLY HILLS MUNICIPAL CODE SEC. 8-4-4**

**Definition:** An approach is located between the edge of the gutter and property line. It is composed of an apron and flairs (see sheet 1 of 2).

1. Any variation from this Driveway Approach Standard must be approved in writing by the City Director of Public Works or his designee. Permits are required for all activities on public right-of-way.

2. **Proposal Plan:** A drawing shall be provided by the applicant to include: Width of proposed apron(s), width of proposed transitional flair areas at side of apron(s), measurement to nearest trees, street lights, other curb cuts, location of property line extension at each side of the site, location of any adjacent neighboring approach, height of the street curb in front of the property, width of the sidewalk, width of the parkway (landscaped area) and any other useful information.
Note: If the project is part of a work to be performed on a private property, the drawing submitted must be stamped with the approval of the Building and Safety Department prior to issuance of an Driveway Approach permit.

3. **Location:** No portion of a driveway approach shall be closer than three feet (3') from any lighting standard, public utility, another driveway, or other device erected in the parkway. Except in single family residential zones, driveway approaches are restricted to access which lead directly to a carport, garage, or parking area located beyond the setback area. Two (2) driveway approaches authorized for any lot or parcel shall not be less than twenty eight feet (28') apart, and each such driveway approach shall be a minimum of two feet (2') from the side property line as measured at the beginning of the full height curb. Any circular driveway shall have a minimum outer radius of twenty six (26') feet. The transportation/engineering official may approve a driveway approach closer to the side property line, or closer to any tree, lighting standard, public utility, another driveway or a device erected in the parkway where necessary to accommodate existing topography or nonremovable objects, such as buildings, walls, trees, or natural rock outcroppings. No portion of a proposed driveway approach shall be constructed closer than ten (10) feet from the center of any city tree without written approval of the City Arborist.

4. **Concrete Finish:** Approaches shall have a wood float, rotor finish. Sidewalk and curb face shall be troweled and light broom finished. Broken or defective public sidewalk, curb, and gutter adjacent to approaches shall be replaced if found necessary during the inspection of the work by Public Works Inspectors.

5. **Adjacent Approach:** No raised curb will be permitted between two approaches which are adjacent to a common property line and less than 4 feet apart. The approaches shall be continuous. A written consent of adjacent property owner is required to construct a joint approach.Construction of a joint approach includes the removal of the existing adjacent approach and reconstruction of the entire shared approach..

6. **Width:** The maximum overall width of any non-residential driveway approach shall not exceed forty feet (40'). The minimum overall width of any driveway approach shall be sixteen feet (16'). The transportation/engineering official may approve driveway approaches which vary from the widths designated herein to accommodate existing topography, or nonremovable objects, such as buildings, walls, trees, or natural rock outcroppings. Driveway approach widths shall be the transition distance, measured along the curb, from the full height curb on one side to on the opposite side.

7. **Materials and Workmanship:** Shall fully comply with the requirements of the "Standard Specifications for Public Works Construction", ("Greenbook"), latest edition, sections 201-1 and 303-5 respectively.

# NON-RESIDENTIAL DRIVEWAY APPROACH

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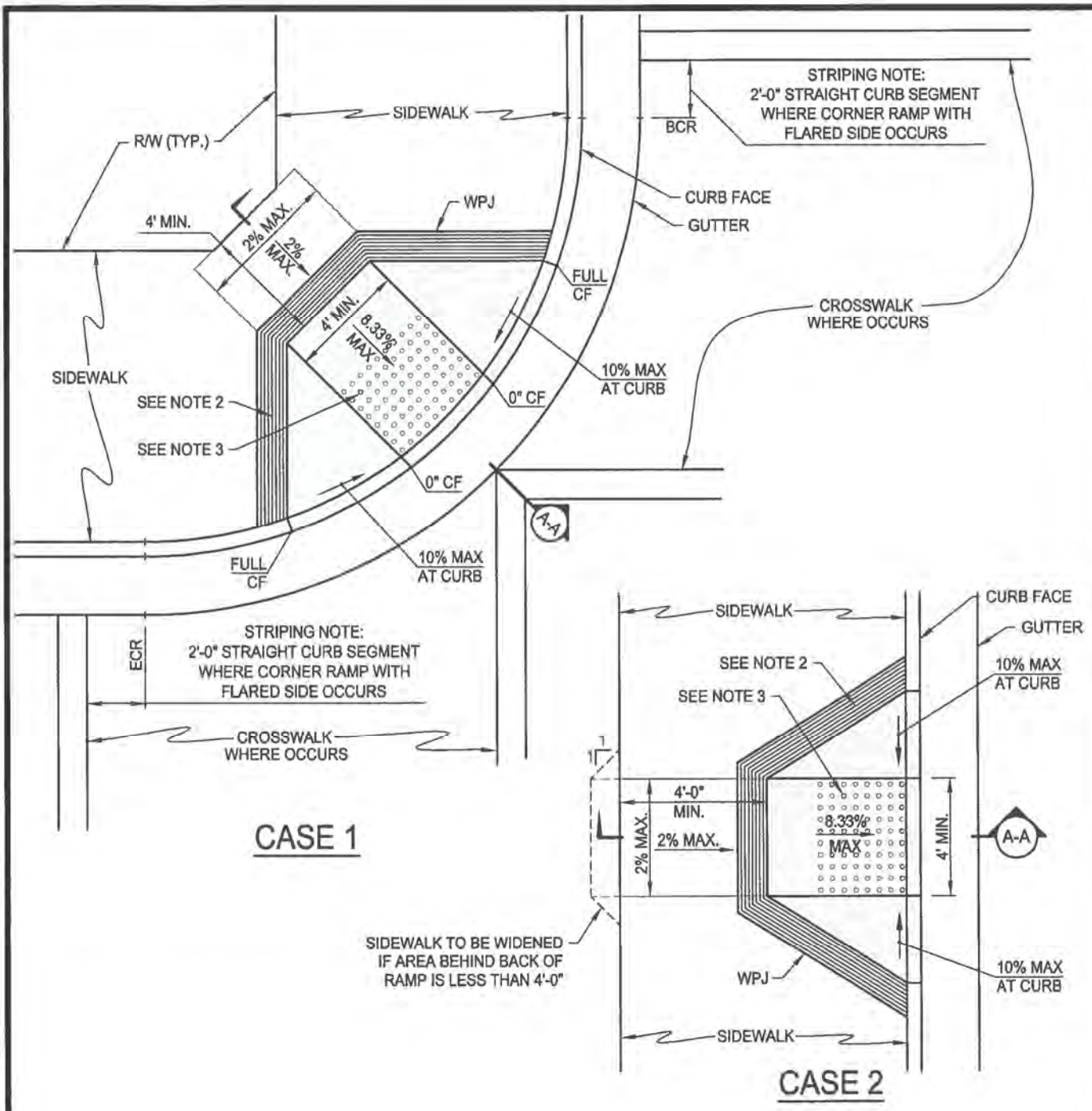
**CITY OF BEVERLY HILLS, CALIFORNIA**
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ DATE 11-18-10
CITY ENGINEER

APPROVED _____ DATE 11-18-10
PUBLIC WORKS DIRECTOR

STANDARD DRAWING
**BH 102**
SHEET 2 OF 2




# CURB RAMPS

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**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

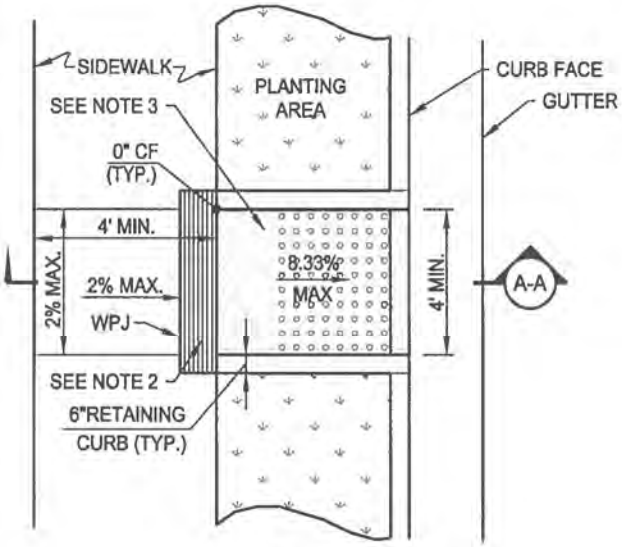
RECOMMENDED _____ CITY ENGINEER DATE 11/18/2011

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-11

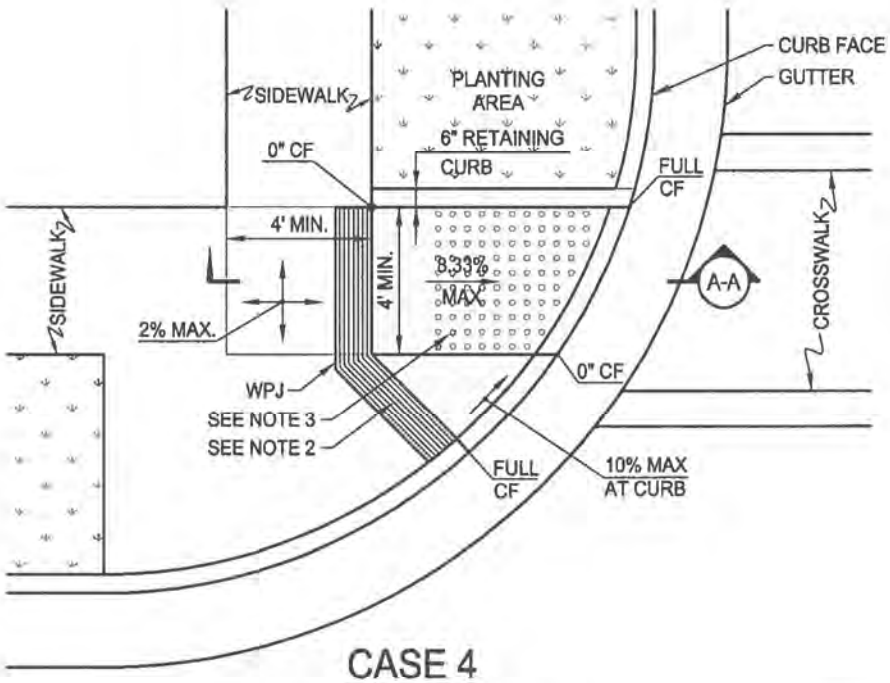
STANDARD DRAWING

**BH 103**

SHEET 1 OF 4




CASE 3




CASE 4

# CURB RAMPS

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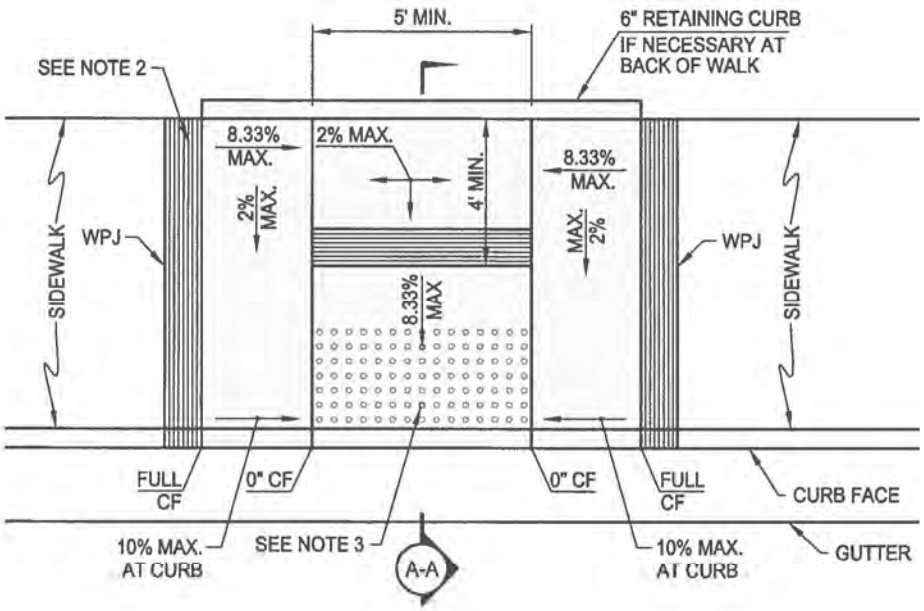
**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 11/18/2014

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-14

STANDARD DRAWING
**BH 103**
SHEET 2 OF 4

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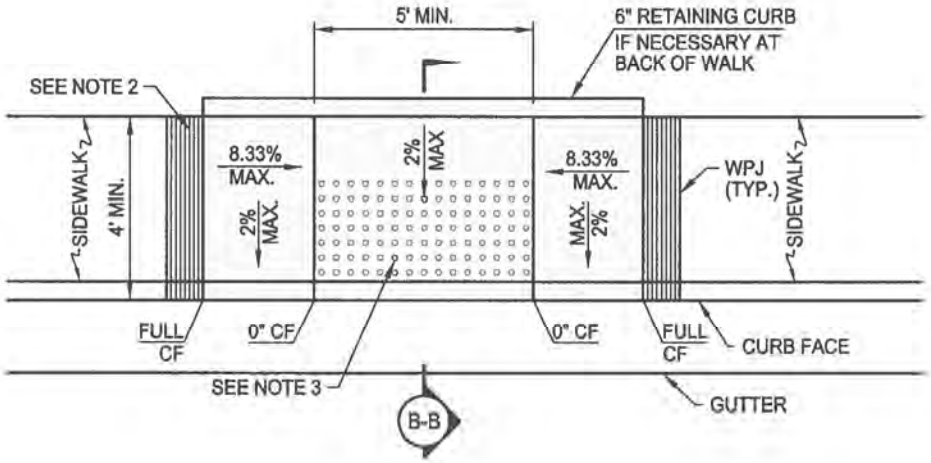


CASE 6

# CURB RAMPS

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**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 11/18/2011

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-11

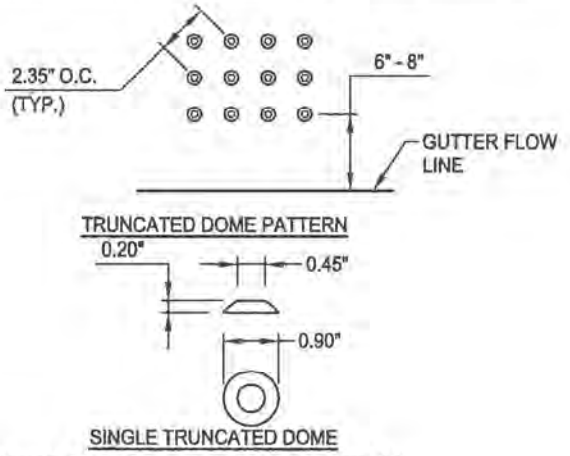
STANDARD DRAWING

**BH 103**

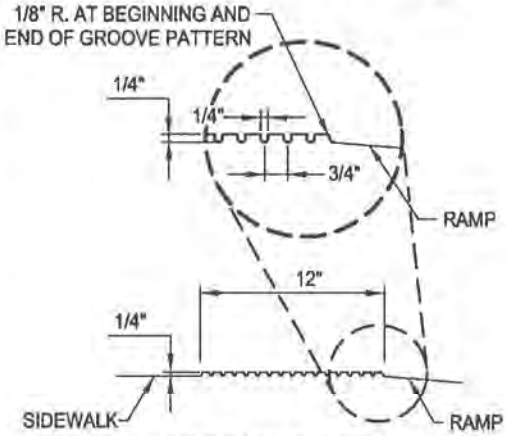
SHEET 3 OF 4

NOTES:

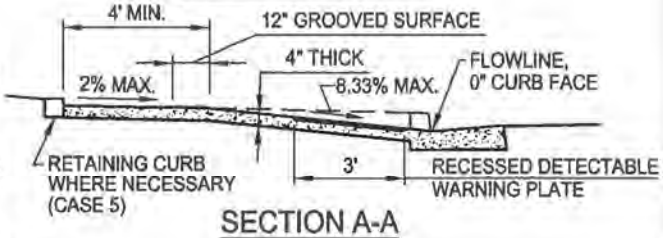
1. CONCRETE SHALL BE CLASS 520-C-2500 AND SHALL BE 4" THICK OVER 4" CRUSHED MISCELLANEOUS BASE AT 90% RELATIVE COMPACTION.
2. THE CURB RAMP SHALL BE OUTLINED, AS SHOWN WITH A 12" WIDE BORDER WITH 1/4" GROOVES APPROXIMATELY 3/4" ON CENTER. SEE GROOVING DETAIL.
3. CURB RAMPS SHALL HAVE A RECESSED YELLOW DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH AND 3' DEPTH OF THE RAMP. EDGES SHALL BE FLUSH WITH THE SURFACE OF THE RAMP. SEE DETECTABLE WARNING DETAIL FOR SIZE AND PATTERN. THE EDGE OF THE DETECTABLE WARNING NEAREST TO THE STREET SHALL BE BETWEEN 6" AND 8" FROM THE GUTTER FL.
4. UTILITY PULL BOXES, MANHOLES, VAULTS AND OTHER UTILITY FACILITIES WITHIN THE BOUNDARIES OF THE CURB RAMP WILL BE RELOCATED BY THE OWNER PRIOR TO, OR IN CONJUNCTION WITH, THE CONSTRUCTION OF THE RAMP.
5. TRANSITIONS FROM RAMPS AND LANDING TO WALKS, GUTTERS OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
6. MAXIMUM SLOPES OF ADJOINING GUTTERS, THE ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP OR ACCESSIBLE ROUTE SHALL NOT EXCEED 5 PERCENT WITHIN 48" OF THE TOP AND BOTTOM OF CURB RAMP.
7. THE BOTTOM OF THE RAMP SHALL HAVE A 0 INCH LIP AT CURB FACE.
8. IF DISTANCE FROM CURB TO BACK OF SIDEWALK IS TOO SHORT TO ACCOMMODATE RAMP AND 4' - 0" LANDING AS SHOWN IN CASE 1 AND CASE 2, THE SIDEWALK MAY BE DEPRESSED LONGITUDINALLY AS IN CASE 5 OR 6, OR SIDEWALK MAY BE WIDENED AS SHOWN IN CASE 2.
9. AS SITE CONDITIONS DICTATE, THE RETAINING CURB SIDE AND THE FLARED SIDE OF CASE 4 RAMP SHALL BE CONSTRUCTED IN REVERSE POSITION.
10. IF LOCATED ON A CURVE, THE SIDES OF THE RAMP NEED NOT BE PARALLEL, BUT THE MINIMUM WIDTH OF THE RAMP SHALL BE 4' - 0".
11. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
12. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.




DETECTABLE WARNING DETAIL




GROOVING DETAIL




SECTION A-A


SECTION B-B

# CURB RAMPS

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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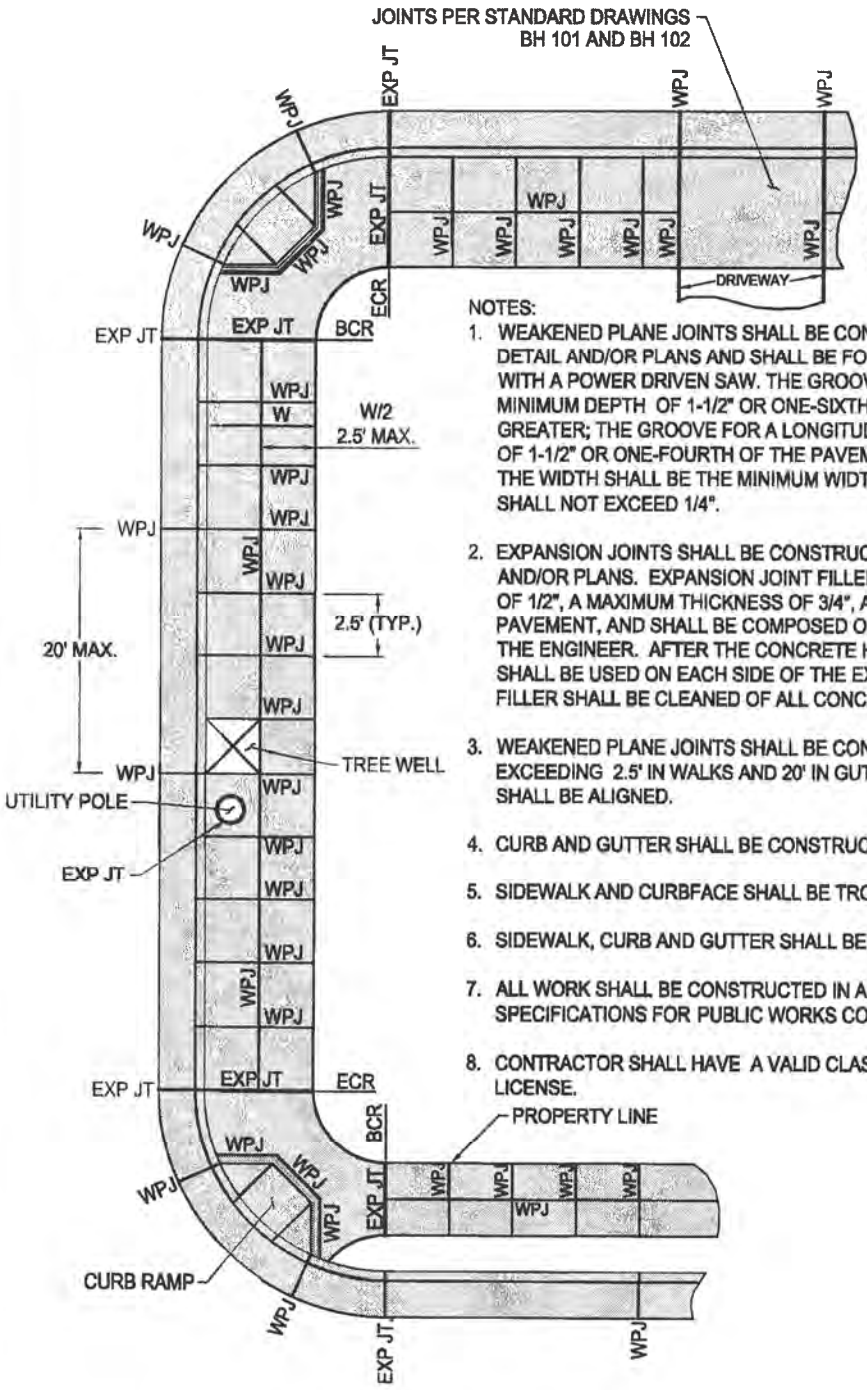
**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 11/18/2011

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-11

STANDARD DRAWING
**BH 103**
SHEET 4 OF 4




ABBREVIATIONS:

WPJ - WEAKENED PLANE JOINT
EXP JT - EXPANSION JOINT
BCR - BEGINNING OF CURB RETURN
ECR - END OF CURB RETURN

NOTES:

1. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT LOCATIONS SHOWN ON THE DETAIL AND/OR PLANS AND SHALL BE FORMED BY CUTTING A GROOVE IN THE PAVEMENT WITH A POWER DRIVEN SAW. THE GROOVE FOR A TRANSVERSE JOINT SHALL BE CUT TO A MINIMUM DEPTH OF 1-1/2" OR ONE-SIXTH OF THE PAVEMENT THICKNESS, WHICHEVER IS GREATER; THE GROOVE FOR A LONGITUDINAL JOINT SHALL BE CUT TO A MINIMUM DEPTH OF 1-1/2" OR ONE-FOURTH OF THE PAVEMENT THICKNESS, WHICHEVER IS GREATER; AND THE WIDTH SHALL BE THE MINIMUM WIDTH POSSIBLE WITH THE SAW BEING USED, BUT SHALL NOT EXCEED 1/4".
2. EXPANSION JOINTS SHALL BE CONSTRUCTED AT LOCATIONS SHOWN ON THE DETAIL AND/OR PLANS. EXPANSION JOINT FILLER MATERIAL SHALL HAVE A MINIMUM THICKNESS OF 1/2", A MAXIMUM THICKNESS OF 3/4", A DEPTH EQUAL TO THE THICKNESS OF THE PAVEMENT, AND SHALL BE COMPOSED OF MATERIALS AS SPECIFIED OR APPROVED BY THE ENGINEER. AFTER THE CONCRETE HAS BEEN FINISHED, AN EDGER OF 1/4" RADIUS SHALL BE USED ON EACH SIDE OF THE EXPANSION JOINT FILLER. THE EXPANSION JOINT FILLER SHALL BE CLEANED OF ALL CONCRETE MORTAR.
3. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT REGULAR INTERVALS NOT EXCEEDING 2.5' IN WALKS AND 20' IN GUTTERS. JOINTS IN CURB, GUTTER, AND WALK SHALL BE ALIGNED.
4. CURB AND GUTTER SHALL BE CONSTRUCTED SEPARATELY FROM SIDEWALK.
5. SIDEWALK AND CURBFACE SHALL BE TROWELED AND LIGHT BROOM FINISHED.
6. SIDEWALK, CURB AND GUTTER SHALL BE CONSTRUCTED OF CLASS 520-C-2500 PCC.
7. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
8. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# CURB AND SIDEWALK JOINTS

| REVISIONS | | |
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| MARK | DATE | DESCRIPTION |
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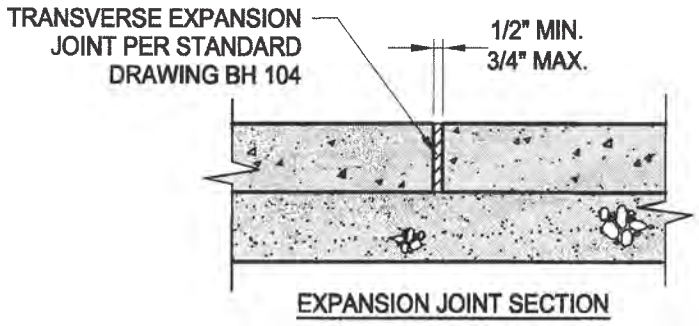
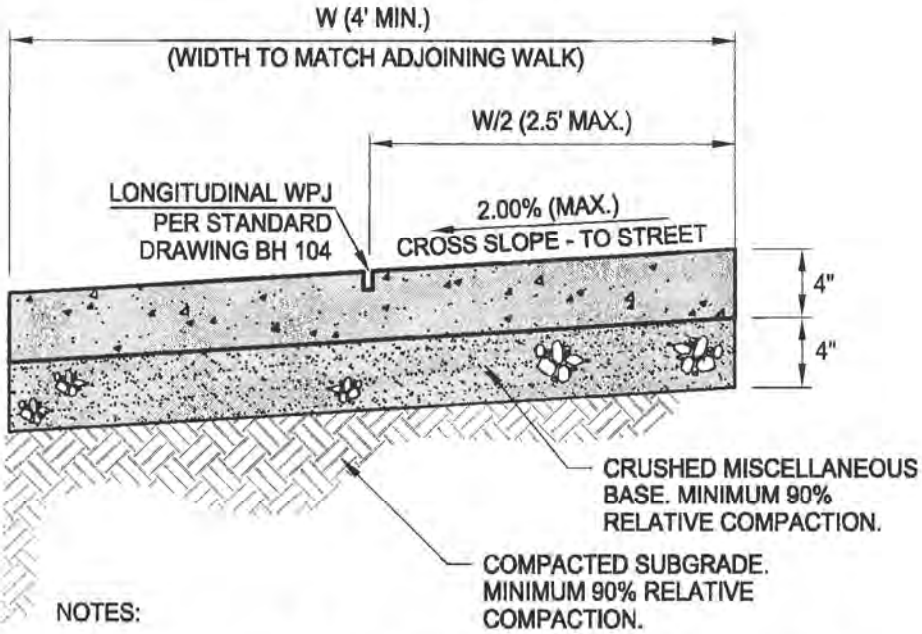
STANDARD DRAWING
**BH 104**
SHEET 1 OF 1




EXPANSION JOINT SECTION




NOTES:

1. SIDEWALK SHALL BE CONSTRUCTED OF CLASS 520-C-2500 PCC.
2. SEE BH 104 FOR JOINT LOCATION PLACEMENT.
3. CRUSHED MISCELLANEOUS BASE TO BE APPROVED BY THE CITY ENGINEER.
4. SIDEWALK SHALL BE TROWLED AND LIGHT BROOM FINISHED.
5. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
6. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# STANDARD SIDEWALK SECTION

| REVISIONS | | |
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| MARK | DATE | DESCRIPTION |
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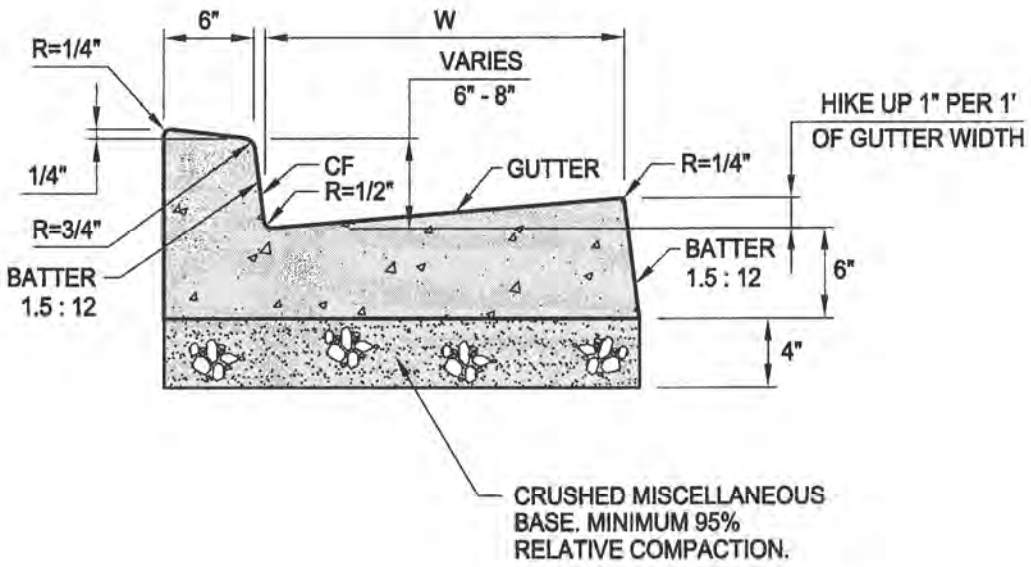
STANDARD DRAWING
**BH 105**
SHEET 1 OF 1




## RESIDENTIAL
## INTEGRAL CURB AND GUTTER SECTION

NOT TO SCALE

NOTES:

1. CURB AND GUTTER SHALL BE CONSTRUCTED OF CLASS 520-C-2500 PCC.
2. GUTTER WIDTH, W, SHALL MATCH EXISTING OR 24" MINIMUM, UNLESS OTHERWISE SPECIFIED.
3. AFTER THE CONCRETE HAS BEEN THOROUGHLY TAMPED TO FORCE THE LARGER AGGREGATE INTO THE CONCRETE AND BRING TO THE TOP SUFFICIENT FREE MORTAR FOR FINISHING, THE SURFACE SHALL BE WORKED TO A TRUE AND EVEN GRADE BY MEANS OF A FLOAT, TROWELED WITH A LONG HANDLED TROWEL OR "FRESNO", AND WOOD-FLOAT FINISHED. THE FLOWLINE OF THE GUTTER SHALL BE TROWELED SMOOTH FOR A WIDTH OF 4 INCHES FOR INTEGRAL CURB AND GUTTER. SIDE FORMS SHALL REMAIN IN PLACE FOR AT LEAST 24 HOURS AFTER COMPLETION OF THE GUTTER, BUT MUST BE REMOVED BEFORE THE WORK WILL BE ACCEPTED.
4. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
5. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# RESIDENTIAL INTEGRAL CURB AND GUTTER DETAIL

| REVISIONS | | |
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| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

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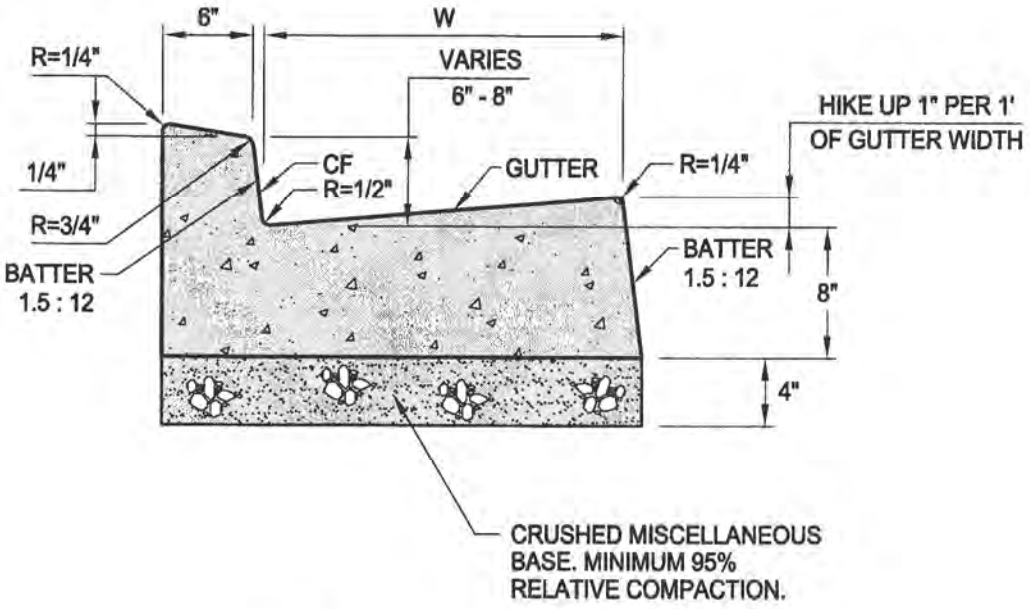
STANDARD DRAWING

**BH 106**

SHEET 1 OF 1




## NON-RESIDENTIAL
## INTEGRAL CURB AND GUTTER SECTION

NOT TO SCALE

NOTES:

1. CURB AND GUTTER SHALL BE CONSTRUCTED OF CLASS 520-C-2500 PCC.
2. GUTTER WIDTH, W, SHALL MATCH EXISTING OR 24" MINIMUM, UNLESS OTHERWISE SPECIFIED.
3. AFTER THE CONCRETE HAS BEEN THOROUGHLY TAMPED TO FORCE THE LARGER AGGREGATE INTO THE CONCRETE AND BRING TO THE TOP SUFFICIENT FREE MORTAR FOR FINISHING, THE SURFACE SHALL BE WORKED TO A TRUE AND EVEN GRADE BY MEANS OF A FLOAT, TROWELED WITH A LONG HANDLED TROWEL OR "FRESNO", AND WOOD-FLOAT FINISHED. THE FLOWLINE OF THE GUTTER SHALL BE TROWELED SMOOTH FOR A WIDTH OF 4 INCHES FOR INTEGRAL CURB AND GUTTER. SIDE FORMS SHALL REMAIN IN PLACE FOR AT LEAST 24 HOURS AFTER COMPLETION OF THE GUTTER, BUT MUST BE REMOVED BEFORE THE WORK WILL BE ACCEPTED.
4. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
5. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# NON-RESIDENTIAL INTEGRAL CURB AND GUTTER DETAIL

| REVISIONS | | |
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| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 7-30-09

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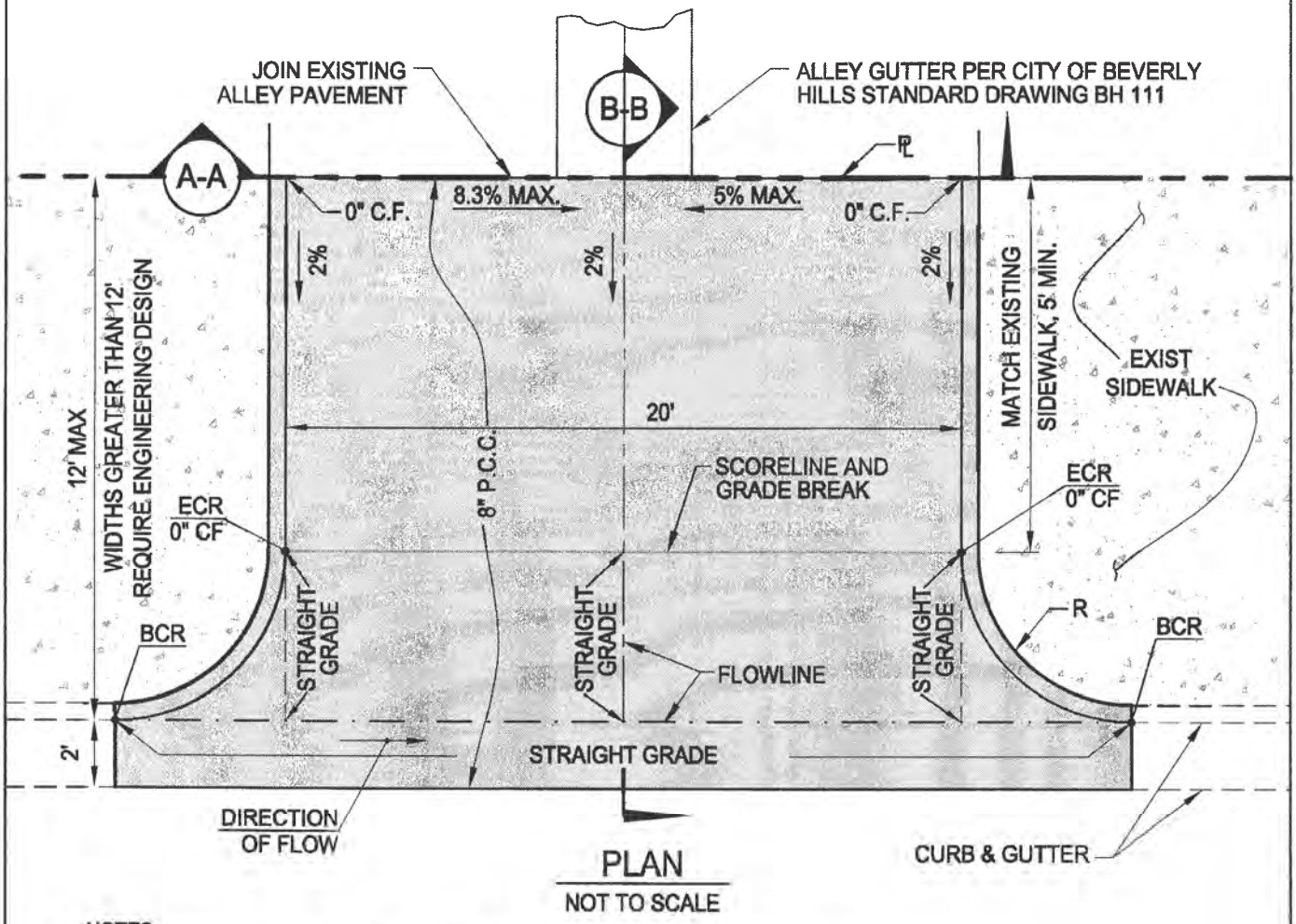
STANDARD DRAWING
**BH 107**
SHEET 1 OF 1




PLAN

NOT TO SCALE

NOTES:

1. CURB RETURN RADIUS, R, SHALL BE 5' TYPICAL, UNLESS OTHERWISE SPECIFIED.
2. TOP OF CURB ELEVATIONS SHALL MATCH EXISTING SIDEWALK ELEVATIONS.
3. ALLEY APPROACH WITH A SLOPE EXCEEDING 16.66% SLOPE SHALL REQUIRE A SPECIAL PERMIT FROM THE TRANSPORTATION/ ENGINEERING OFFICIAL.
4. ACTUAL SHAPE AND LOCATION OF ALLEY APPROACH SHALL BE DETERMINED IN THE FIELD BY THE CITY ENGINEER.
5. ALLEY APPROACH AND NEW SIDEWALK WITHIN ALLEY APPROACH SHALL BE A CLASS 520-C-2500 8" THICK MONOLITHIC POUR OVER 6" CRUSHED MISCELLANEOUS BASE AT 95% RELATIVE COMPACTION.
6. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT EDITION OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
7. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# ALLEY APPROACH DETAIL

| REVISIONS | | |
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| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

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CIVIL ENGINEERING DIVISION

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CITY ENGINEER

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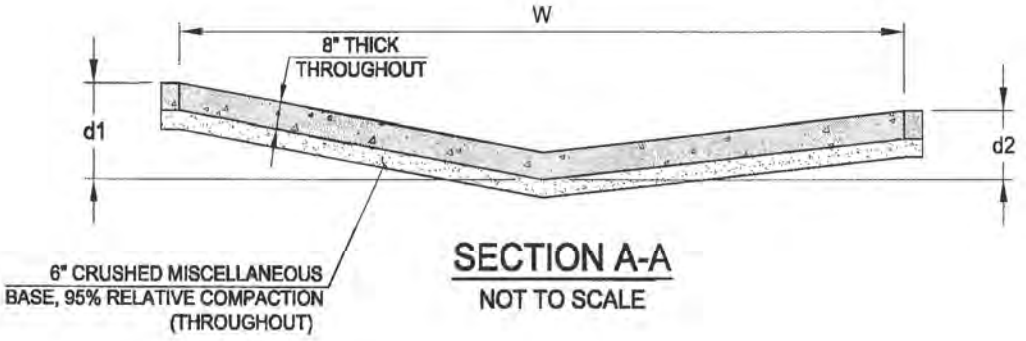
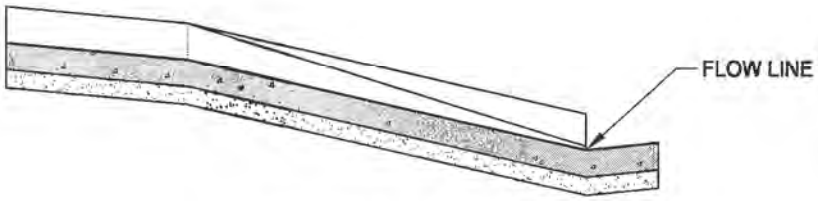
PUBLIC WORKS DIRECTOR

STANDARD DRAWING
**BH 108**
SHEET 1 OF 2

| W | 8' | 10' | 15' | 20' | 25' | 30' |
|---|---|---|---|---|---|---|
| d1, MAX | 4" | 5" | 7.5" | 10" | 12.5" | 15" |
| d2, MIN | 2" | 3" | 3" | 3" | 3" | 3" |




SECTION A-A
NOT TO SCALE




SECTION B-B
NOT TO SCALE

# ALLEY APPROACH DETAIL

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CITY OF BEVERLY HILLS, CALIFORNIA
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CIVIL ENGINEERING DIVISION

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CITY ENGINEER

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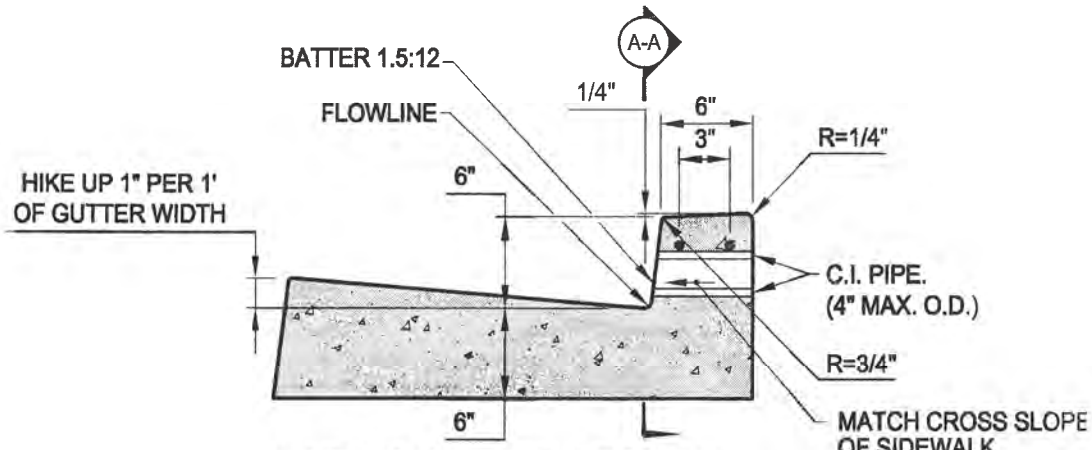
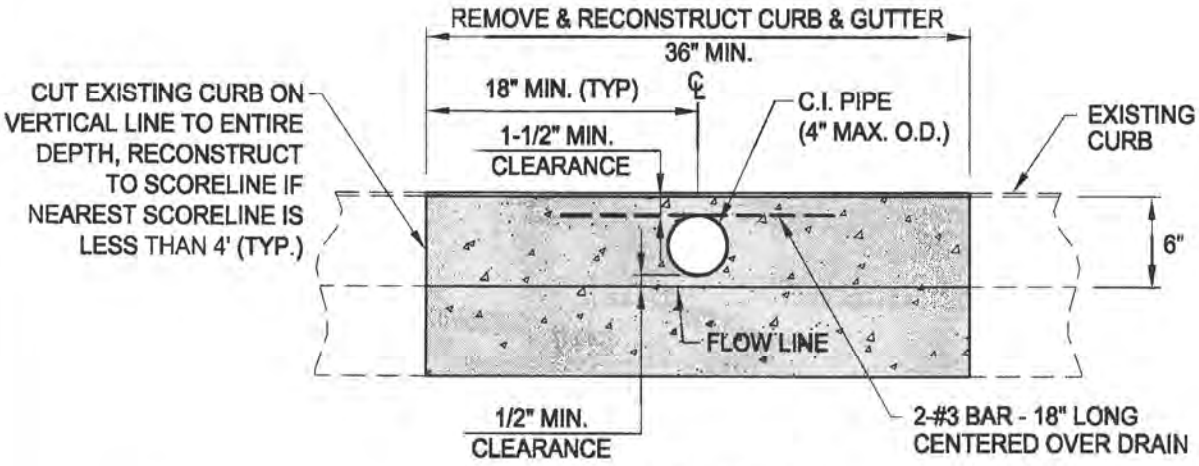
PUBLIC WORKS DIRECTOR

STANDARD DRAWING
**BH 108**
SHEET 2 OF 2




## CURB & GUTTER SECTION

NOT TO SCALE




## ELEVATION "A-A"

NOT TO SCALE

NOTES:

1. MINIMUM CURB BREAK AND RECONSTRUCTION IS 3'-0" IN LENGTH.
2. CURB & GUTTER SHALL BE CLASS 520-C-2500 PCC MONOLITHIC POUR.
3. FOR MULTIPLE CURB DRAINS, SPACING BETWEEN C.I. PIPES SHALL BE A MINIMUM OF 6" O.C.
4. 3" PIPE IN 6" CURB IS ALLOWED BY CORING.
5. FOR OTHER CONDITIONS SEE APWA STANDARD PLAN 150-2.
6. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
7. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# 4" CURB DRAIN IN 6" CURB

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**CITY OF BEVERLY HILLS, CALIFORNIA**

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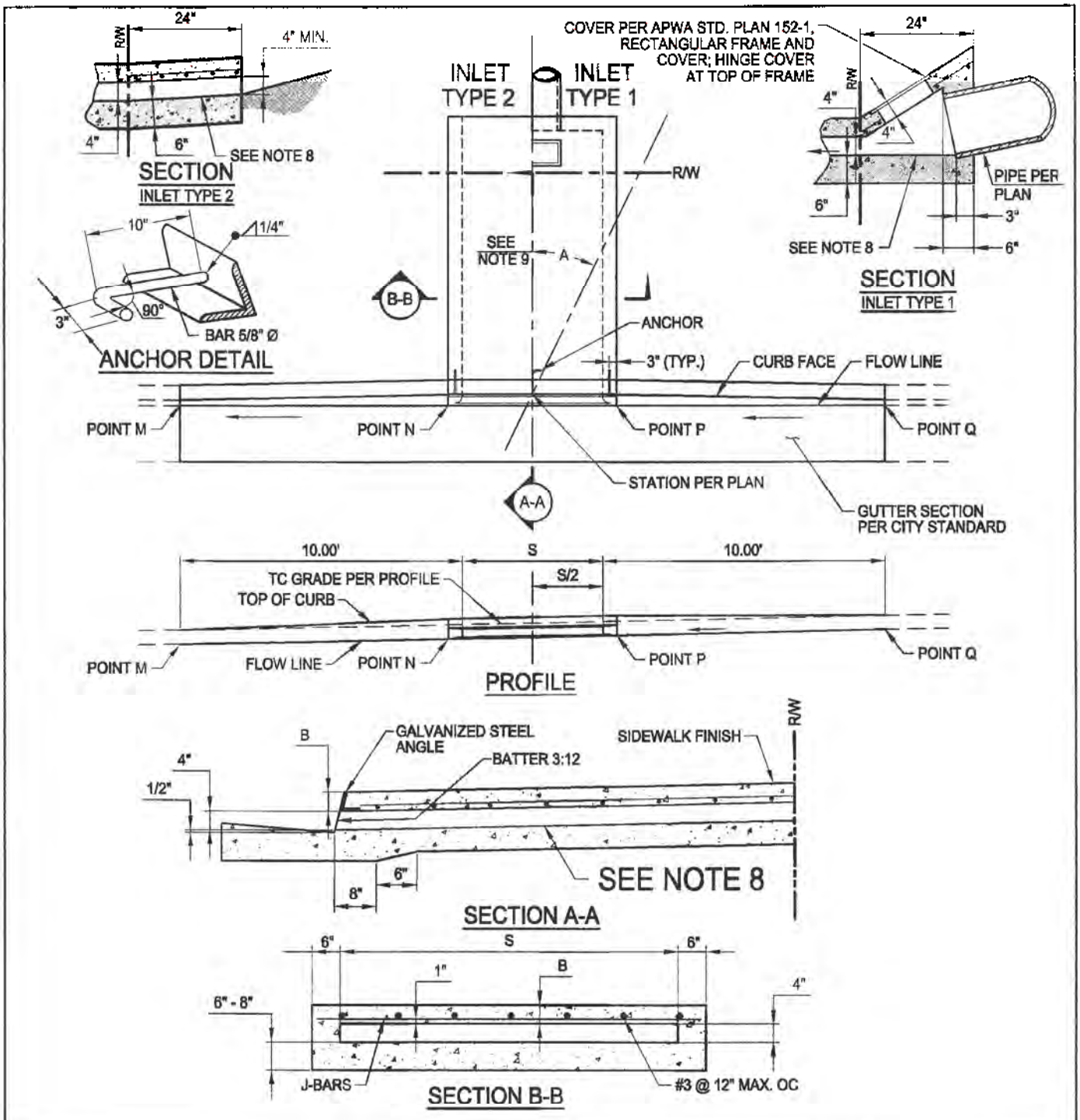
STANDARD DRAWING

**BH 109**

SHEET 1 OF 1




# PARKWAY DRAIN

| REVISIONS | | |
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| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

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STANDARD DRAWING

**BH 110**

SHEET 1 OF 2

| S | J BAR SPACING |
|---|---|
| 12" | 7" |
| 18" | 7" |
| 24" | 7" |
| 30" | 7" |
| 36" | 7" |
| 42" | 6" |
| 48" | 5" |
| 54" | 6-12" |
| 60" | 5" |
| 66" | 4" |
| 72" | 3-1/2" |

FOR S = 30" AND LESS, USE 2 ANCHORS. OTHERWISE, USE 3 ANCHORS

FOR S = 48" AND LESS, B=3"
USE 2-1/2"X2"x1/2" GALVANIZED STEEL ANGLE.
OTHERWISE, B = 4".

USE 3-1/2"x3"x1/2" GALVANIZED STEEL ANGLE

NOTES:

1. FLOOR OF BOX SHALL BE TROWELED SMOOTH.
2. IF TOE OF SLOPE IS ALLOWED WITHIN THE R/W, INLET TYPE 1 BEGINS AT THE TOE RATHER THAN AT THE R/W LINE.
3. FOR OPEN DITCH (TYPE 2), THE 24" EXTENSION BEYOND THE R/W LINE IS NOT REQUIRED WHEN BACK OF WALK IS 24" OR MORE FROM THE R/W LINE; HOWEVER, THE PIPE SHALL EXTEND TO THE R/W LINE IN ANY EVENT.
4. TOP OF INLET STRUCTURE (TYPE 1 & 2) SHALL BE FLUSH WITH ADJACENT SURFACE WHERE PRACTICAL.
5. A HEADED STEEL STUD, 5/8" x 6-3/8" WITH A 1" HEAD ATTACHED BY A FULL PENETRATION BUTT WELD MAY BE USED AS AN ALTERNATE ANCHOR.
6. NORMAL CURB FACE AT POINT M AND Q. CURB FACE IS B + 5" AT POINT N AND P.
7. THE 3" LEG OF THE 5/8" DIA. ANCHORS SHALL BE PARALLEL TO THE TOP OF SIDEWALK.
8. SLOPE = 2.0%
9. ANGLE 'A' SHALL BE 30° MINIMUM WHEN ROADWAY SLOPE IS GREATER THAT 5.0%.
10. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
11. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# PARKWAY DRAIN

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**
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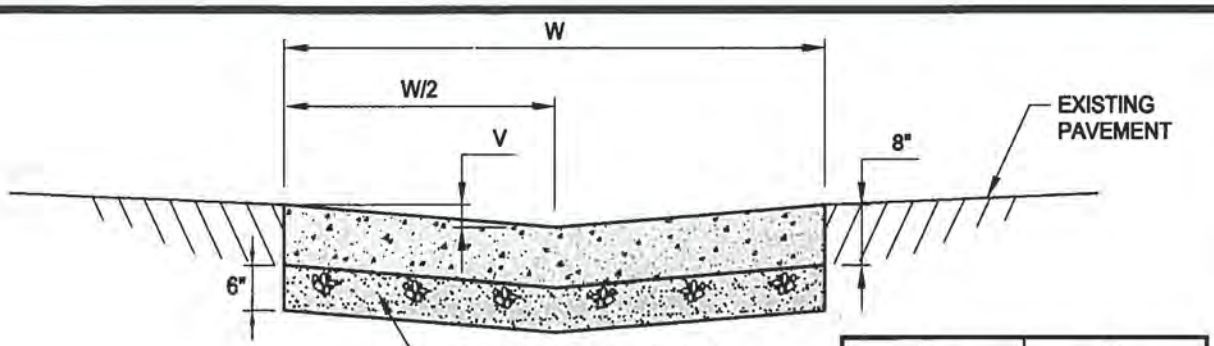
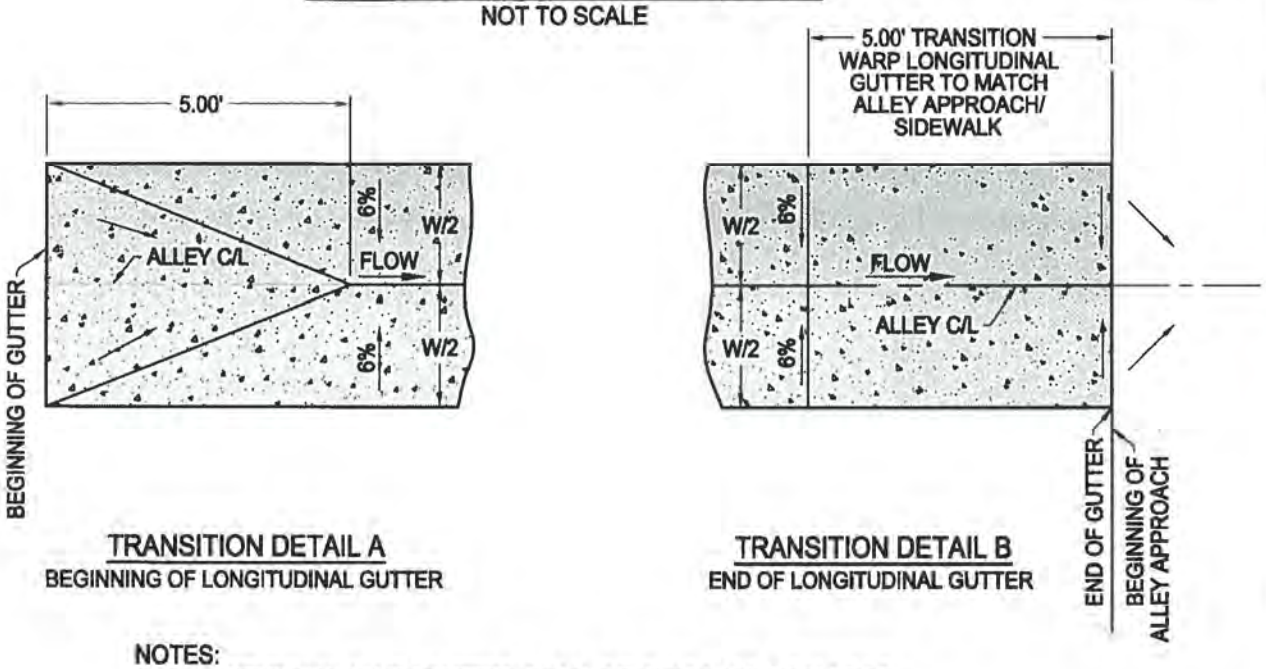
STANDARD DRAWING
**BH 110**
SHEET 2 OF 2




| W | V |
|---|---|
| 2' - 0" | 3/4" |
| 4' - 0" | 1-1/2" |

## LONGITUDINAL ALLEY GUTTER

NOT TO SCALE




### TRANSITION DETAIL A
BEGINNING OF LONGITUDINAL GUTTER

### TRANSITION DETAIL B
END OF LONGITUDINAL GUTTER

NOTES:

1. LONGITUDINAL ALLEY GUTTER SHALL BE CLASS 520-C-2500 PCC.
2. CONTROL JOINTS SHALL BE PLACED AT 10' INTERVALS FOR FULL LENGTH OF LONGITUDINAL GUTTER.
3. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
4. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# LONGITUDINAL ALLEY GUTTER DETAIL

| REVISIONS | | |
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| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

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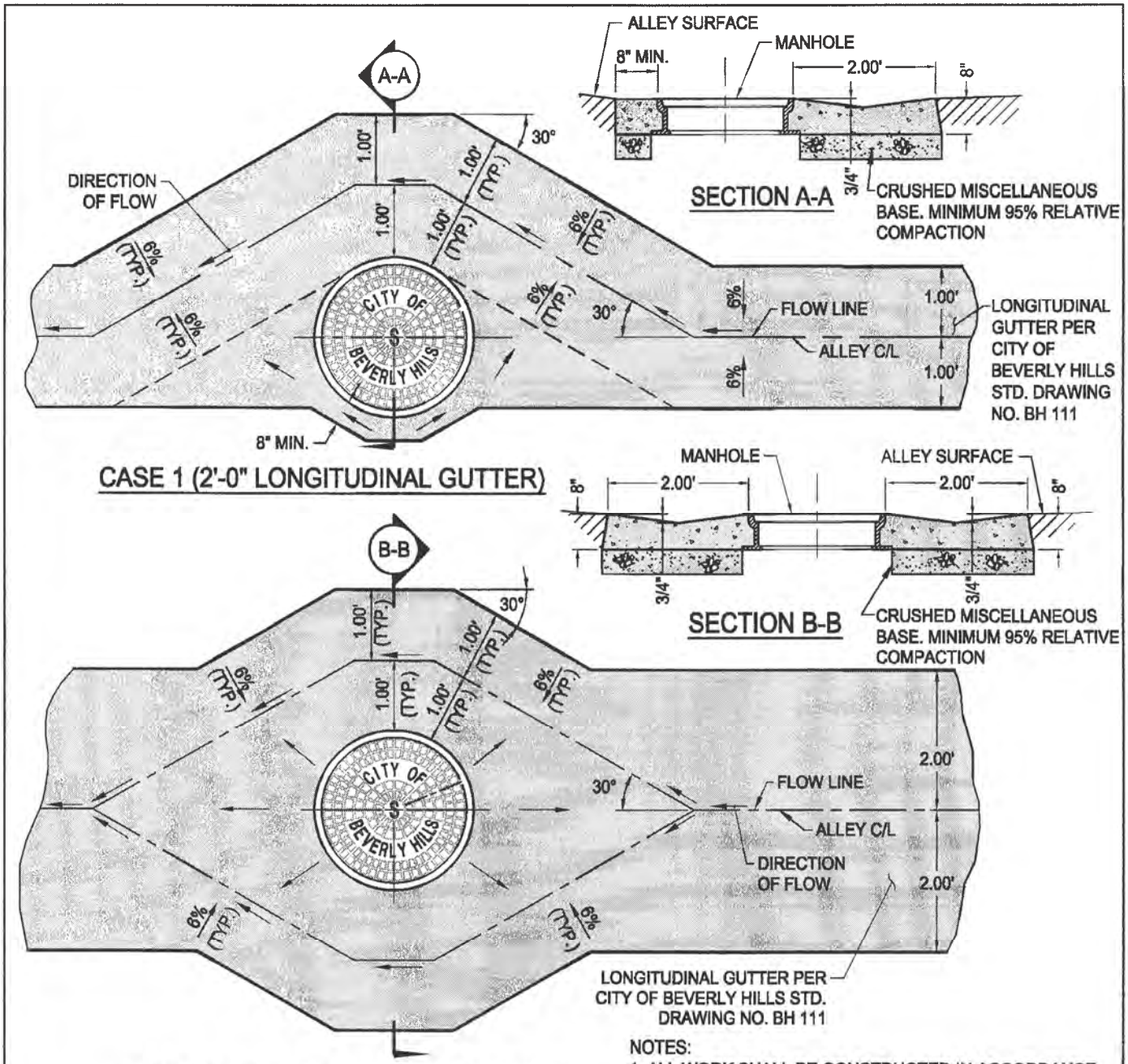
STANDARD DRAWING

**BH 111**

SHEET 1 OF 1




NOTES:

1. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
2. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# LONGITUDINAL ALLEY GUTTER AT MANHOLE

| REVISIONS | | |
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| MARK | DATE | DESCRIPTION |
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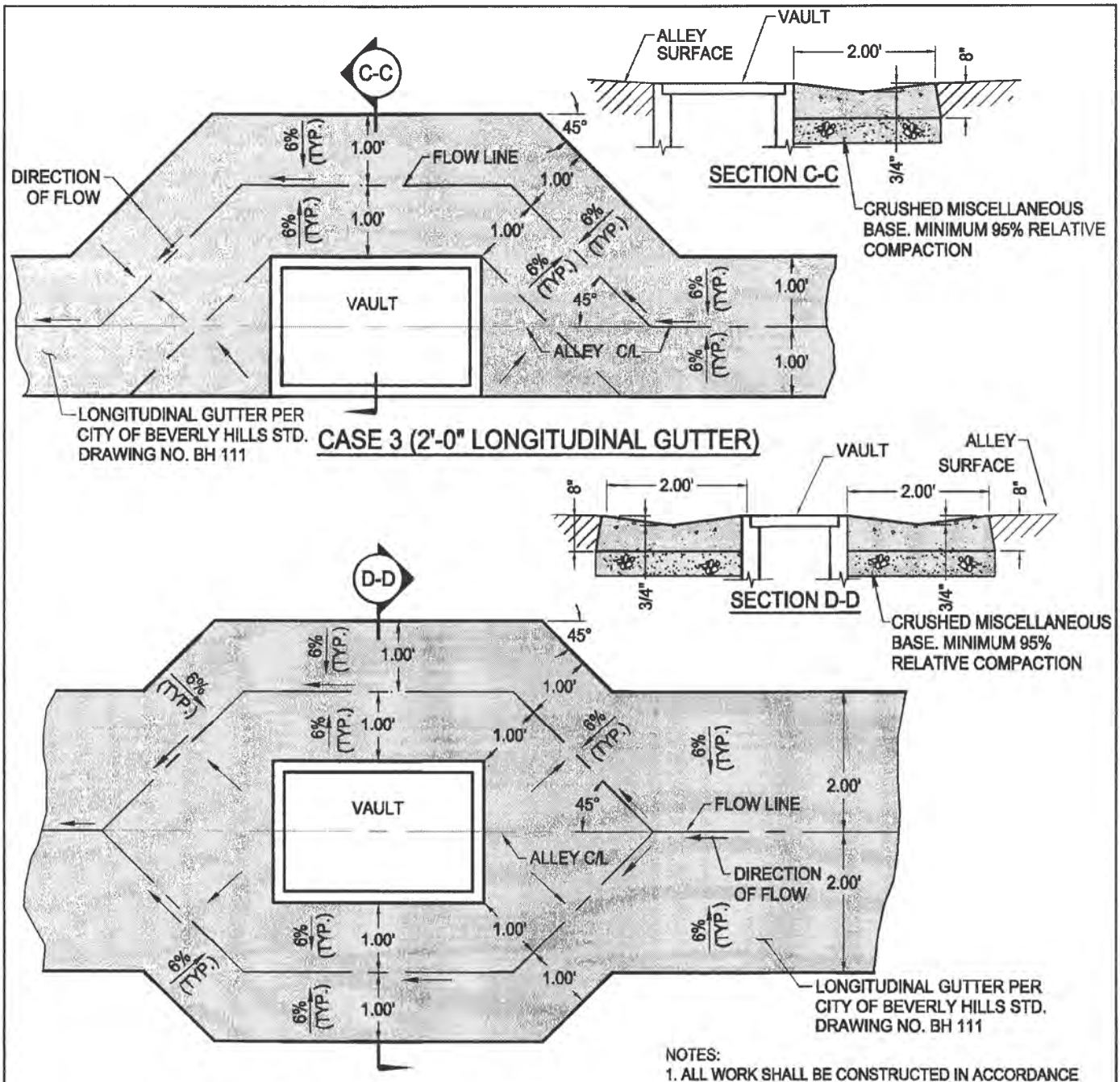
STANDARD DRAWING

**BH 112**

SHEET 1 OF 2




CASE 3 (2'-0" LONGITUDINAL GUTTER)




CASE 4 (4'-0" LONGITUDINAL GUTTER)

NOTES:

1. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").
2. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# LONGITUDINAL ALLEY GUTTER AT VAULT

| REVISIONS | | |
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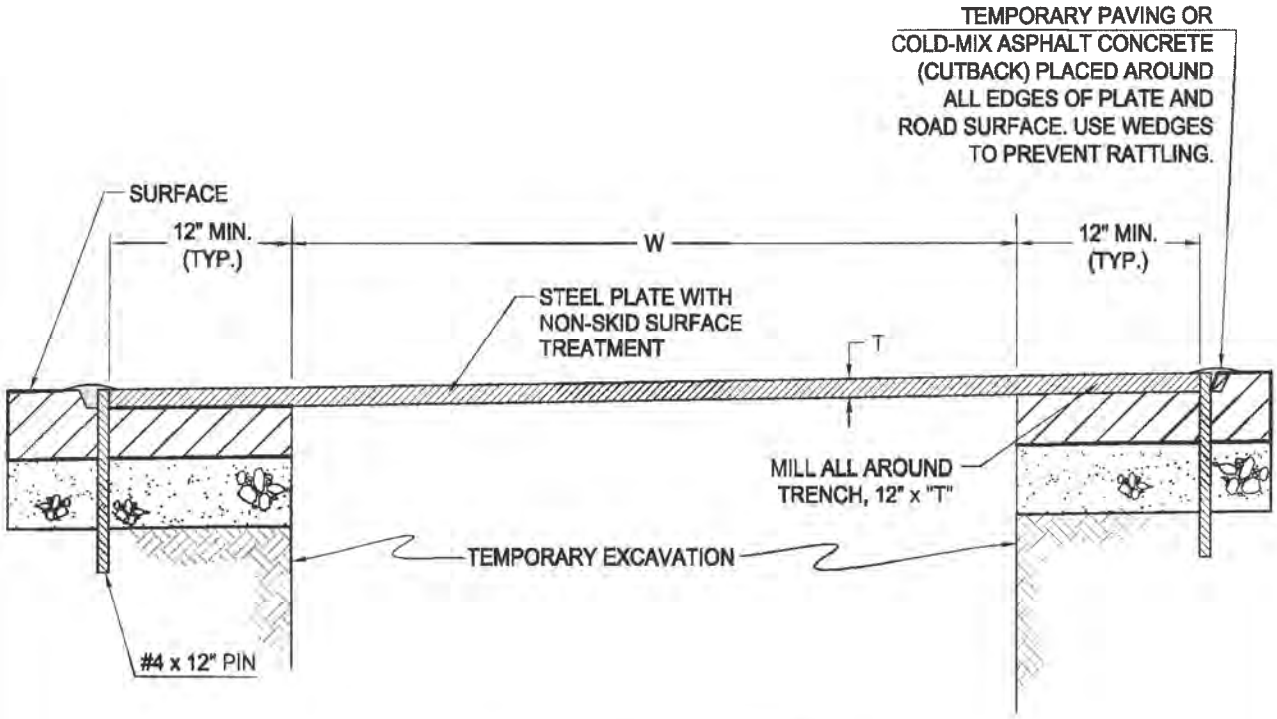
STANDARD DRAWING

**BH 112**

SHEET 2 OF 2




| "W"<br>TRENCH WIDTH | "T"<br>MINIMUM STEEL PLATE THICKNESS |
|---|---|
| ≤3' - 0" | 1 INCH |
| >3' - 0", UP TO 4' - 0" | 1-1/4 INCH |

NOTES:

1. ALL STEEL TRENCH PLATES SHALL BE FULLY SUPPORTED AROUND THE PERIMETER TO PREVENT TIPPING.
2. TRENCHES AND EXCAVATIONS SHALL BE ADEQUATELY SHORED OR BRACED TO WITHSTAND HIGHWAY TRAFFIC LOADS.
3. WHEN TWO OR MORE PLATES ARE USED, THE PLATES SHALL BE TACK WELDED AT EACH CORNER OR AS REQUIRED BY THE CITY ENGINEER.
4. ALL TRENCH PLATES SHALL BE PINNED IN EACH CORNER WITH PINS MADE OF #4 REBAR, OR EQUIVALENT DIAMETER STEEL ROD, WITH A MINIMUM LENGTH OF 12"
5. ALL TRENCH PLATING SHALL BE DESIGNED FOR HS20-44 TRUCK LOADING.
6. FOR TRENCHES AND EXCAVATIONS WITH SPANS GREATER THAN FOUR FEET (4'), A STRUCTURAL DESIGN SHALL BE PREPARED BY A REGISTERED CIVIL OR STRUCTURAL ENGINEER AND REVIEWED BY THE CITY.
7. TRENCH PLATES SHALL BE USED WHEN TRENCH WORK CAN NOT BE COMPLETED WITHIN THE SAME WORKING DAY TO MAINTAIN ALL VEHICULAR, BICYCLE AND PEDESTRIAN TRAFFIC FLOW.
8. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# STEEL PLATE FOR OPEN TRENCH DETAIL

| REVISIONS | | |
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**CITY OF BEVERLY HILLS, CALIFORNIA**
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 7-30-09

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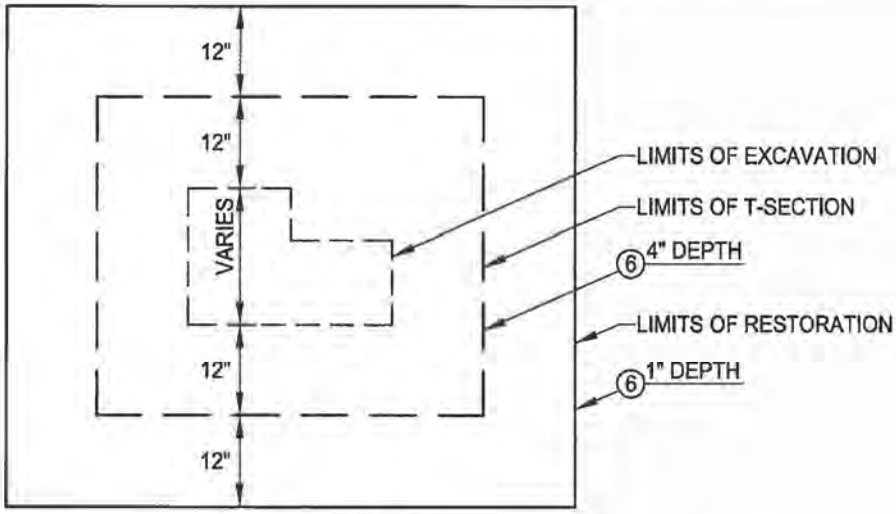
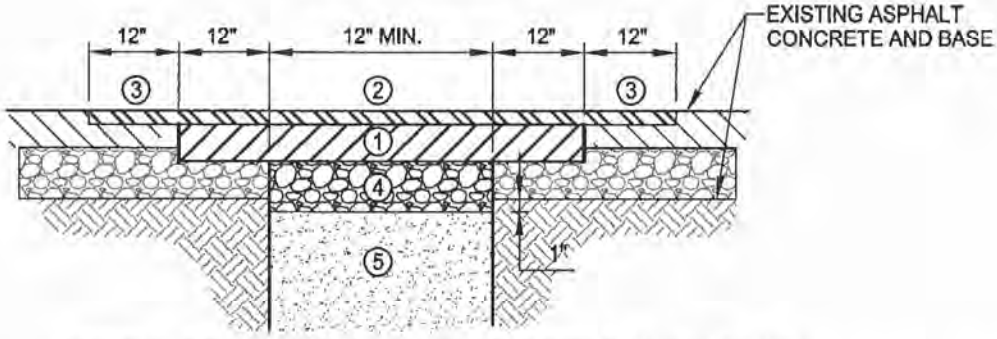
STANDARD DRAWING
**BH 113**
SHEET 1 OF 1




CASE I - PLAN




CASE I - EXISTING SECTION: ASPHALT CONCRETE

① CONSTRUCT NEW ASPHALT CONCRETE BASE COURSE, TYPE B, PG 64-10, 1" THICKER THAN THE EXISTING SECTION.

② CONSTRUCT NEW ASPHALT CONCRETE WEARING COURSE:

| TYPES OF STREETS | DEPTH | ASPHALT CONCRETE |
|---|---|---|
| LOCAL RESIDENTIAL STREETS | 1" | TYPE D2, PG-64-10 |
| STREETS WITH RUBBERIZED ASPHALT | 2" MIN | ARHM-GG PG-64-16 |
| COLLECTOR/MAJOR STREETS | 1-1/2" | TYPE C2, PG-64-10 |

① AND ②: THE TOTAL THICKNESS OF ① + ② SHALL BE 4" MINIMUM FOR LOCAL OR COLLECTOR STREETS AND 6" MINIMUM FOR MAJOR STREETS. ASPHALT CONCRETE LAYERS SHALL BE COMPACTED TO 95% OF MAXIMUM THEORETICAL SPECIFIC GRAVITY.

# PAVEMENT REPLACEMENT SECTION - CASE I

| REVISIONS | | |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

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STANDARD DRAWING

**BH 114**

SHEET 1 OF 4

③ A. THE LIMITS OF THE RESTORATION SHALL BE A RECTANGULAR AREA EXTENDING A MINIMUM OF 12" BEYOND THE OUTER EDGE OF THE WIDEST PORTION OF THE T-SECTION. THE LIMITS SHALL BE SAWCUT AFTER BACKFILL OF TRENCH IS COMPLETED. THE EXISTING A.C. SHALL BE REMOVED TO A DEPTH EQUAL TO THE THICKNESS OF THE WEARING COURSE. REMOVAL BY COLD MILLING OR PNEUMATIC HAMMER IS ACCEPTABLE. IF THE REMOVALS ARE LESS THAN 5' APART OR LESS THAN 2' FROM A CONCRETE CURB, GUTTER OR CROSS GUTTER, THE RESTORATION SHALL BE CONTINUOUS BETWEEN EXCAVATIONS AND/OR THE EDGE OF THE CONCRETE.

④ CONSTRUCT NEW CRUSHED AGGREGATE BASE TO MATCH EXISTING THICKNESS OR 4" THICKNESS, WHICHEVER IS GREATER. COMPACT TO 95% OF RELATIVE DENSITY.

⑤ TRENCH BACKFILL SHALL BE EITHER:

A. NATIVE MATERIAL OR IMPORTED SOIL (IF NATIVE IS UNSUITABLE)
B. CRUSHED AGGREGATE BASE
C. TWO SACK CEMENT SAND SLURRY

COMPACTION TEST (USING CITY APPROVED METHOD) ARE REQUIRED UNLESS SLURRY IS USED.

⑥ SAWCUTTING WILL BE REQUIRED AROUND THE PERIMETER OF THE FINAL EDGE OF ALL EXCAVATIONS TO PROVIDE CLEAN, STRAIGHT, VERTICAL SIDES.

7. T-SECTIONS ARE 12" WIDE AS MEASURED FROM THE FINAL EDGE OF TRENCH (AFTER SLUFFING).

8. ALL TRAFFIC STRIPING AND/OR MARKINGS REMOVED BY RESTORATION WORK SHALL BE REPLACED.

9. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT EDITION OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS ("GREENBOOK").

10. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# PAVEMENT REPLACEMENT SECTION - CASE I

| REVISIONS | | |
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| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**
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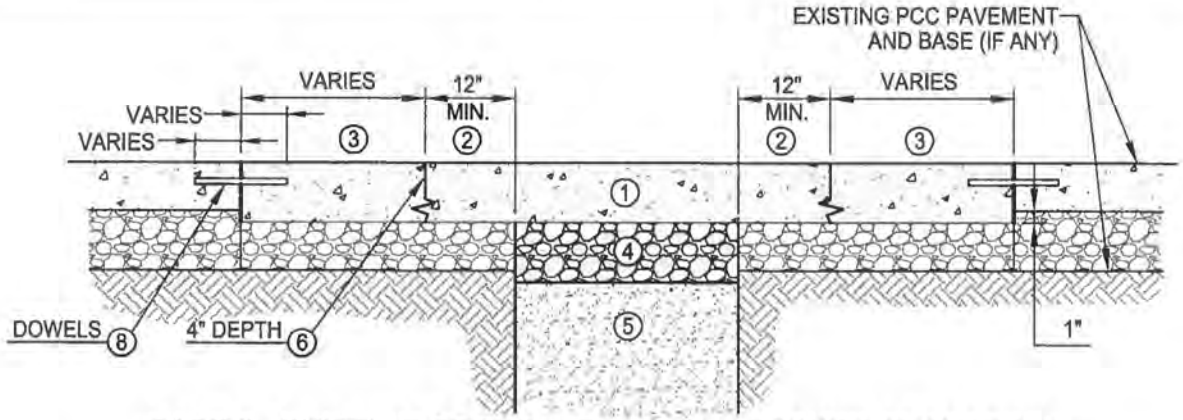
STANDARD DRAWING
**BH 114**
SHEET 2 OF 4




## CASE II - EXISTING SECTION: PORTLAND CONCRETE CEMENT

① CONSTRUCT NEW PCC PAVEMENT 1" THICKER THAN THE EXISTING CONCRETE, 6" MINIMUM.

② THE EXACT LIMITS FOR REMOVAL SHALL BE DETERMINED BY THE CITY ENGINEER SUCH THAT JOIN LINES ARE NOT WITHIN 2'-6" OF EXISTING PAVEMENT JOINTS OR SIGNIFICANT CRACKS. IF THE EXCAVATIONS ARE LESS THAN 5' APART OR LESS THAN 2'-6" FROM A CONCRETE CURB, GUTTER OR EXPANSION JOINT, THE RESTORATION SHALL BE CONTINUOUS BETWEEN EXCAVATIONS AND/OR THE EDGE OF CONCRETE.

③ FOR PCC STREETS OR INTERSECTIONS THE LIMITS OF THE RESTORATION SHALL BE A RECTANGULAR AREA EXTENDING TO THE NEAREST CONSTRUCTION JOINT. THE STRUCTURAL SECTION OUTSIDE THE UTILITY TRENCH AREA SHALL BE EQUAL TO ① + ④.

④ CONSTRUCT NEW CRUSHED AGGREGATE BASE TO MATCH EXISTING THICKNESS OR 4" THICKNESS, WHICHEVER IS GREATER. COMPACT TO 95% OF RELATIVE DENSITY.

⑤ TRENCH BACKFILL SHALL BE EITHER:

A. NATIVE MATERIAL OR IMPORTED SOIL (IF NATIVE IS UNSUITABLE)
B. CRUSHED AGGREGATE BASE
C. TWO SACK CEMENT SAND SLURRY

COMPACTION TEST (USING CITY APPROVED METHOD) ARE REQUIRED UNLESS SLURRY IS USED.

⑥ SAWCUTTING WILL BE REQUIRED AROUND THE PERIMETER OF THE FINAL EDGE OF ALL EXCAVATIONS TO PROVIDE CLEAN, STRAIGHT, VERTICAL SIDES.

⑦ DOWEL SIZE, SPACING, AND EMBEDMENT SHOULD BE AS FOLLOWS:

| CONCRETE THICKNESS | SIZE AND SPACING | EMBEDMENT |
|---|---|---|
| 6" | #4 @ 16" O.C. | 4" |
| 8" | #5 @ 16" O.C. | 6" |
| 10" | #6 @ 16" O.C. | 8" |

8. ALL TRAFFIC STRIPING AND/OR MARKINGS REMOVED BY RESTORATION WORK SHALL BE REPLACED.

9. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT EDITION OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS ("GREENBOOK").

10. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# PAVEMENT REPLACEMENT SECTION - CASE II

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| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**
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CIVIL ENGINEERING DIVISION

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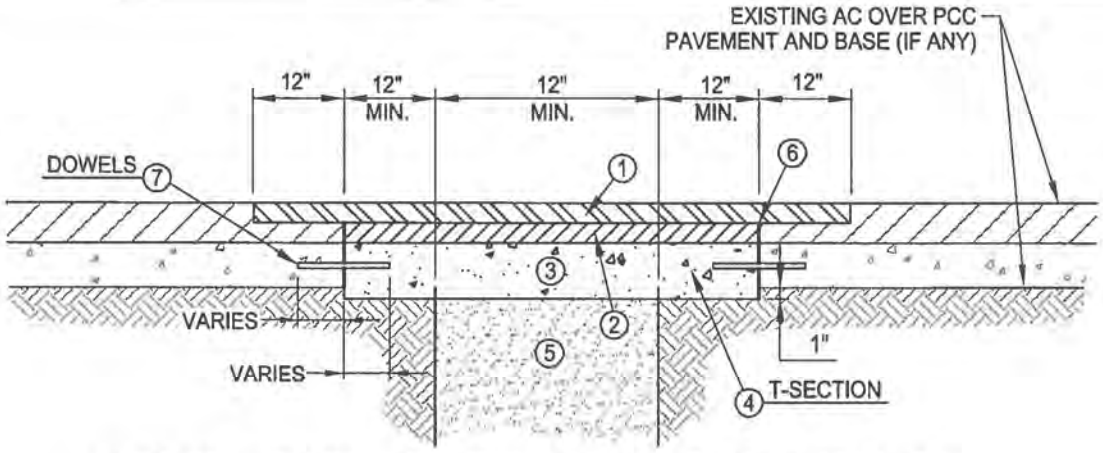
STANDARD DRAWING
**BH 114**
SHEET 3 OF 4




## CASE III - EXISTING SECTION: ASPHALT OVER CONCRETE

① CONSTRUCT 1" NEW ASPHALT CONCRETE WEARING COURSE TYPE D2, PG 64-10. FOR STREETS WITH RUBBERIZED ASPHALT USE ARHM-GG PG-64-16, 2" MIN.

② CONSTRUCT NEW ASPHALT CONCRETE BASE COURSE, TYPE B, PG 64-10.

③ CONSTRUCT NEW PCC PAVEMENT BASE, 560-C-3250, 1" THICKER THAN THE EXISTING CONCRETE, 6" MINIMUM. ASPHALT CONCRETE LAYERS SHALL BE COMPACTED TO 95% OF MAXIMUM THEORETICAL SPECIFIC GRAVITY.

④ THE EXACT LIMITS FOR REMOVAL SHALL BE DETERMINED BY THE CITY ENGINEER SUCH THAT JOIN LINES ARE NOT WITHIN 2'-6" OF EXISTING PAVEMENT JOINTS OR SIGNIFICANT CRACKS. IF THE EXCAVATIONS ARE LESS THAN 5' APART OR LESS THAN 2'-6" FROM A CONCRETE CURB, GUTTER OR EXPANSION JOINT, THE RESTORATION SHALL BE CONTINUOUS BETWEEN EXCAVATIONS AND/OR THE EDGE OF CONCRETE.

⑤ TRENCH BACKFILL SHALL BE EITHER:

A. NATIVE MATERIAL OR IMPORTED SOIL (IF NATIVE IS UNSUITABLE)
B. CRUSHED AGGREGATE BASE
C. TWO SACK CEMENT SAND SLURRY

COMPACTION TEST (USING CITY APPROVED METHOD) ARE REQUIRED UNLESS SLURRY IS USED.

⑥ SAWCUTTING WILL BE REQUIRED AROUND THE PERIMETER OF THE FINAL EDGE OF ALL EXCAVATIONS TO PROVIDE CLEAN, STRAIGHT, VERTICAL SIDES.

⑦ DOWEL SIZE, SPACING, AND EMBEDMENT SHOULD BE AS FOLLOWS:

| CONCRETE THICKNESS | SIZE AND SPACING | EMBEDMENT |
|---|---|---|
| 6" | #4 @ 16" O.C. | 4" |
| 8" | #5 @ 16" O.C. | 6" |
| 10" | #6 @ 16" O.C. | 8" |

8. ALL TRAFFIC STRIPING AND/OR MARKINGS REMOVED BY RESTORATION WORK SHALL BE REPLACED.

9. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT EDITION OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS ("GREENBOOK").

10. CONTRACTOR SHALL HAVE A VALID CLASS "A" OR "C8" CALIFORNIA CONTRACTOR'S LICENSE.

# PAVEMENT REPLACEMENT SECTION - CASE III

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**CITY OF BEVERLY HILLS, CALIFORNIA**
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
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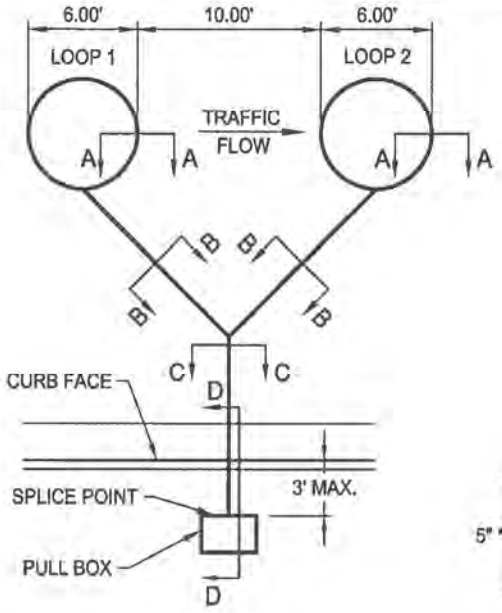
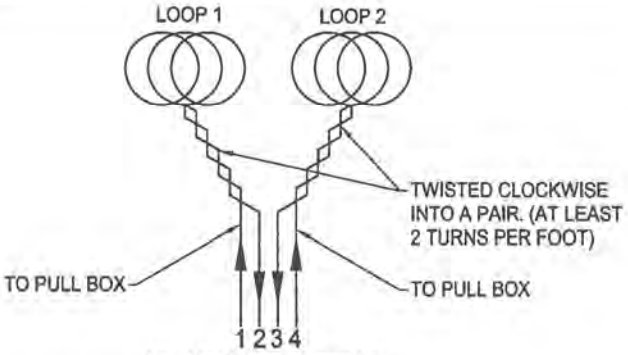
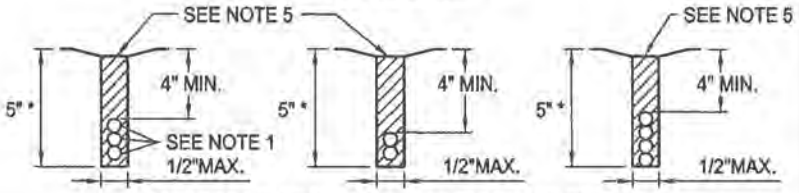
STANDARD DRAWING
**BH 114**
SHEET 4 OF 4




PLAN
NOT TO SCALE




WINDING DETAIL
NOT TO SCALE

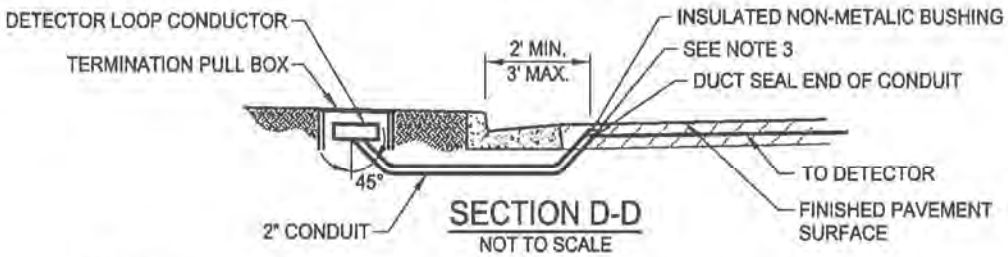



* DEPTH OF SLOT NOT TO EXCEED DEPTH OF PAVEMENT

SECTION A-A
NOT TO SCALE

SECTION B-B
NOT TO SCALE

SECTION C-C
NOT TO SCALE




SECTION D-D
NOT TO SCALE

NOTES:

1. THREE TURNS OF DETECTA-DUCT OR TYPE 2 LOOP WIRE STACKED ONE WIRE ON TOP OF ANOTHER. A PRE-WOUND LOOP WIRE SHALL BE USED IN SLOTS GREATER THAN 1/4" IN WIDTH.
2. LOOP DETECTOR LEAD-IN CABLE EXTENDING FROM THE PULL BOX ADJACENT TO THE LOOP TO THE FIELD TERMINAL IN THE CONTROLLER CABINET SHALL BE TWO, THREE, OR FOUR PAIR #1B AWG INDIVIDUALLY TWISTED, INDIVIDUALLY SHIELDED, FILLED (WATER BLOCKED) CABLE. EACH CABLE SHALL BE IDENTIFIED BY THE INSTALLATION OF A RIGID PLASTIC TAG HELD IN PLACE WITH TWO NYLON TIES.
3. STUB OUT SHALL BE LOCATED AT THE EDGE OF GUTTER IN PAVEMENT, 4" BELOW FINISHED SURFACE OR INSTALL DETECTOR HANDHOLE (CITY OF BH, STANDARD DRAWING BH 402) AS DIRECTED BY CITY ENGINEER.
4. IF THE "STUB OUT" EXCAVATION AREA FOR LOOP HOMERUNS IS GREATER THAN 6" IN DIAMETER, BACKFILL WITH ASPHALT CONCRETE. IF EXCAVATION AREA IS LESS THAN OR EQUAL TO 6" IN DIAMETER,SEAL AREA WITH HOT RUBBERIZED ASPHALT SEALANT.
5. FILL SLOT WITH HOT MELT RUBBERIZED ASPHALT SEALANT IN ACCORDANCE WITH SECTION 86-5.01A OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS. POUR POTS ARE NOT ACCEPTABLE TO APPLY SEALANT.
6. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT EDITION OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

# ROUND INDUCTIVE LOOP DETECTOR INSTALLATION

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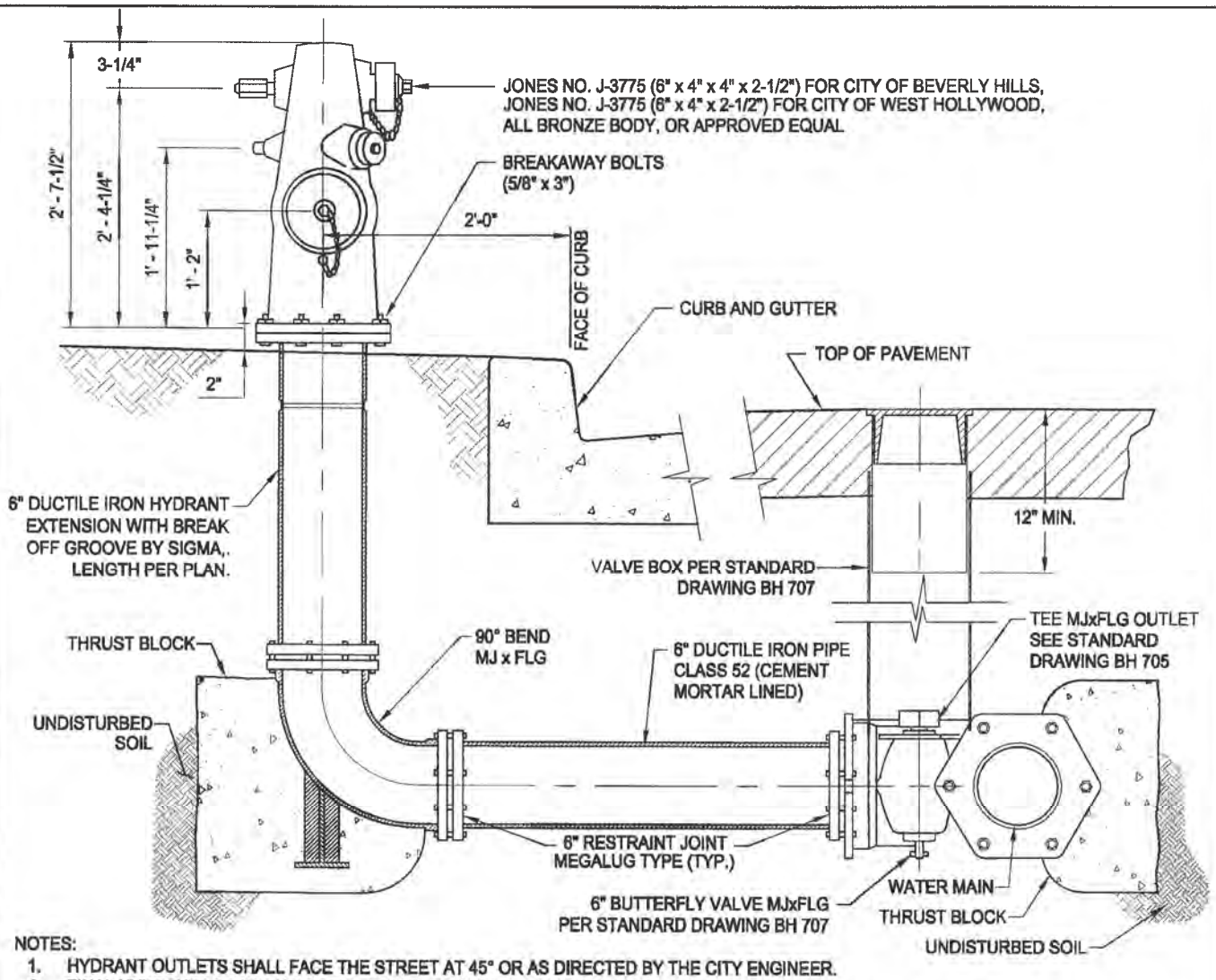
STANDARD DRAWING
**BH 401**
SHEET 1 OF 1




NOTES:

1. HYDRANT OUTLETS SHALL FACE THE STREET AT 45° OR AS DIRECTED BY THE CITY ENGINEER.
2. FINAL HYDRANT LOCATION TO BE DETERMINED BY THE CITY ENGINEER.
3. CONNECTION OF THE FIRE HYDRANT TO THE WATER MAIN MAY REQUIRE FITTING AND COUPLINGS NOT SHOWN HEREON. THE CONTRACTOR SHALL PROVIDE AND INSTALL AT NO EXTRA COST.
4. BREAKAWAY BOLTS SHALL BE USED TO INSTALL THE HYDRANT HEAD ON THE BURY.
5. THRUST BLOCKS SHALL BE PLACED PER STANDARD DRAWING BH 709 OR AS DIRECTED BY THE CITY ENGINEER.
6. FIRE HYDRANTS SHALL BE PAINTED IN ACCORDANCE WITH THE SPECIFICATIONS.
7. ALL HYDRANTS WATER OUTLET CAP MATERIAL SHALL BE BRONZE.
8. ALL FITTINGS USED TO CONNECT THE FIRE HYDRANT TO THE WATER MAIN SHALL BE PROPERLY RESTRAINED WITH APPROVED STANDARD METHODS OR AS DIRECTED BY THE CITY ENGINEER.
9. TRENCHES WITHIN THE ROADWAY FOR LATERAL INSTALLATIONS OR REMOVALS SHALL BE BACKFILLED WITH A SAND SLURRY MIX AS DIRECTED BY THE CITY ENGINEER.
10. EXPOSED BOLT AND NUT ASSEMBLIES ON FLEXIBLE COUPLINGS AND/OR MECHANICAL JOINT FITTINGS SHALL BE COATED WITH TAR BITUMASTIC ENAMEL PRIOR TO BACKFILL.
11. SURFACE CONDITIONS SHALL BE RESTORED TO THE SATISFACTION OF THE CITY ENGINEER.

# FIRE HYDRANT ASSEMBLY (TYPICAL)

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**CITY OF BEVERLY HILLS, CALIFORNIA**

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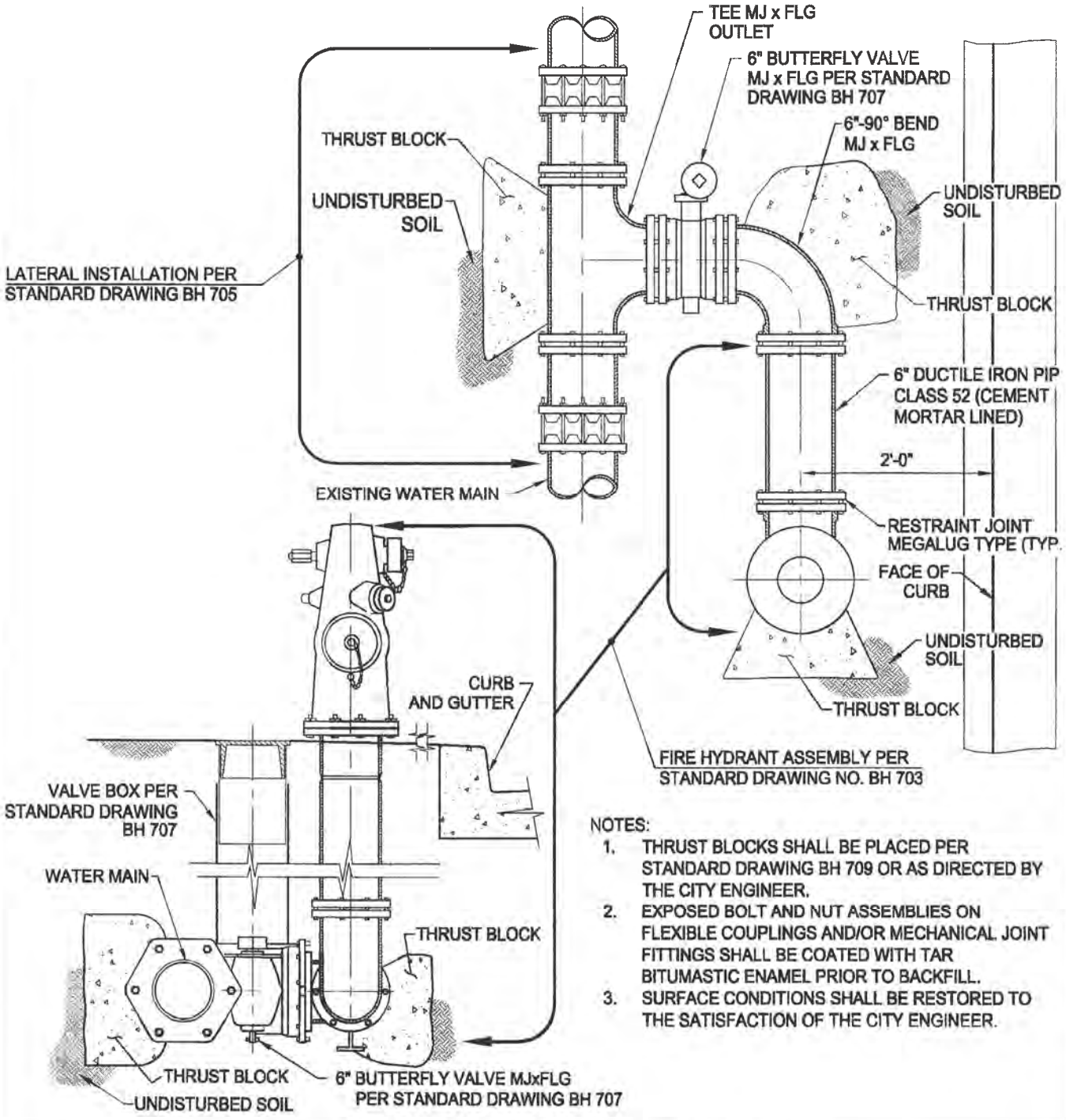
STANDARD DRAWING

**BH 703**

SHEET 1 OF 1




NOTES:

1. THRUST BLOCKS SHALL BE PLACED PER STANDARD DRAWING BH 709 OR AS DIRECTED BY THE CITY ENGINEER.
2. EXPOSED BOLT AND NUT ASSEMBLIES ON FLEXIBLE COUPLINGS AND/OR MECHANICAL JOINT FITTINGS SHALL BE COATED WITH TAR BITUMASTIC ENAMEL PRIOR TO BACKFILL.
3. SURFACE CONDITIONS SHALL BE RESTORED TO THE SATISFACTION OF THE CITY ENGINEER.

# FIRE HYDRANT INSTALLATION

## WITH WATER MAIN BEHIND THE CURB

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**CITY OF BEVERLY HILLS, CALIFORNIA**

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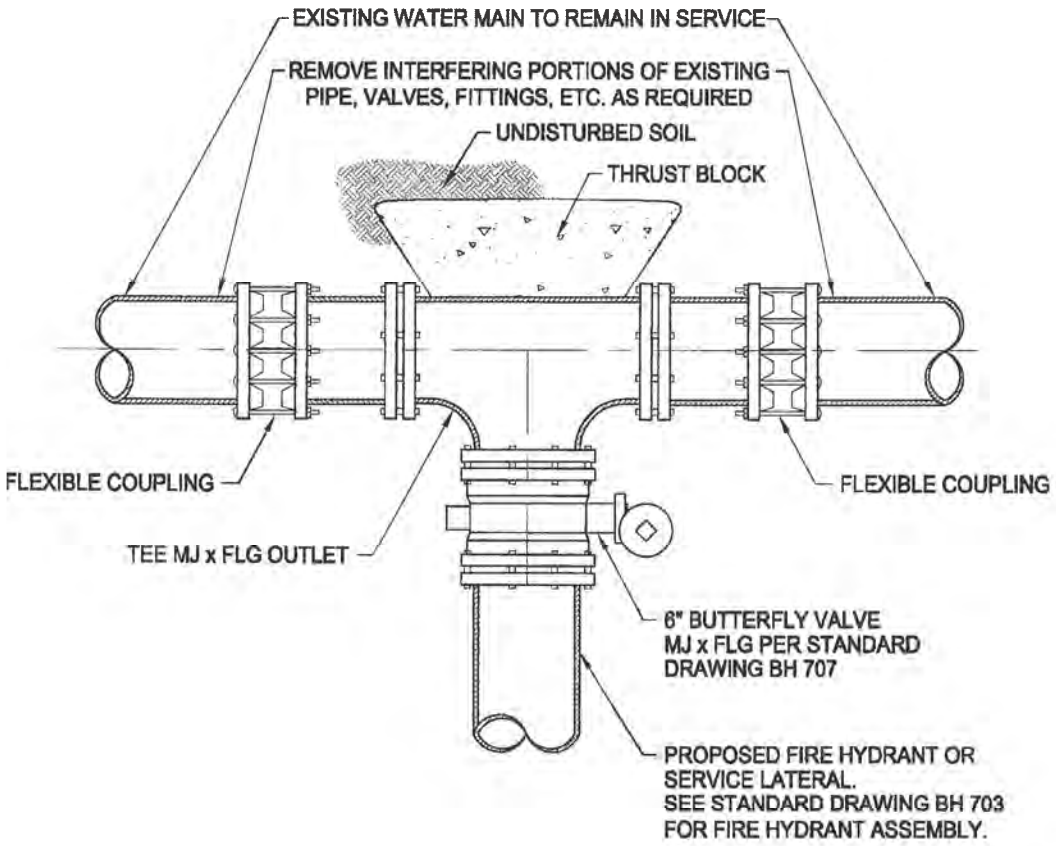
STANDARD DRAWING

**BH 704**

SHEET 1 OF 1




NOTES:

1. THRUST BLOCKS SHALL BE PLACED PER STANDARD DRAWING BH 709 OR AS DIRECTED BY THE CITY ENGINEER.
2. EXPOSED BOLT AND NUT ASSEMBLIES ON FLEXIBLE COUPLINGS AND/OR MECHANICAL JOINT FITTINGS SHALL BE COATED WITH TAR BITUMASTIC ENAMEL PRIOR TO BACKFILL.
3. TRENCHES WITHIN THE ROADWAY FOR LATERAL INSTALLATIONS OR REMOVALS SHALL BE BACKFILLED WITH A SAND SLURRY MIX AS DIRECTED BY THE CITY ENGINEER.
4. SURFACE CONDITIONS SHALL BE RESTORED TO THE SATISFACTION OF THE CITY ENGINEER.

# LATERAL INSTALLATION (FIRE HYDRANT)

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CITY OF BEVERLY HILLS, CALIFORNIA
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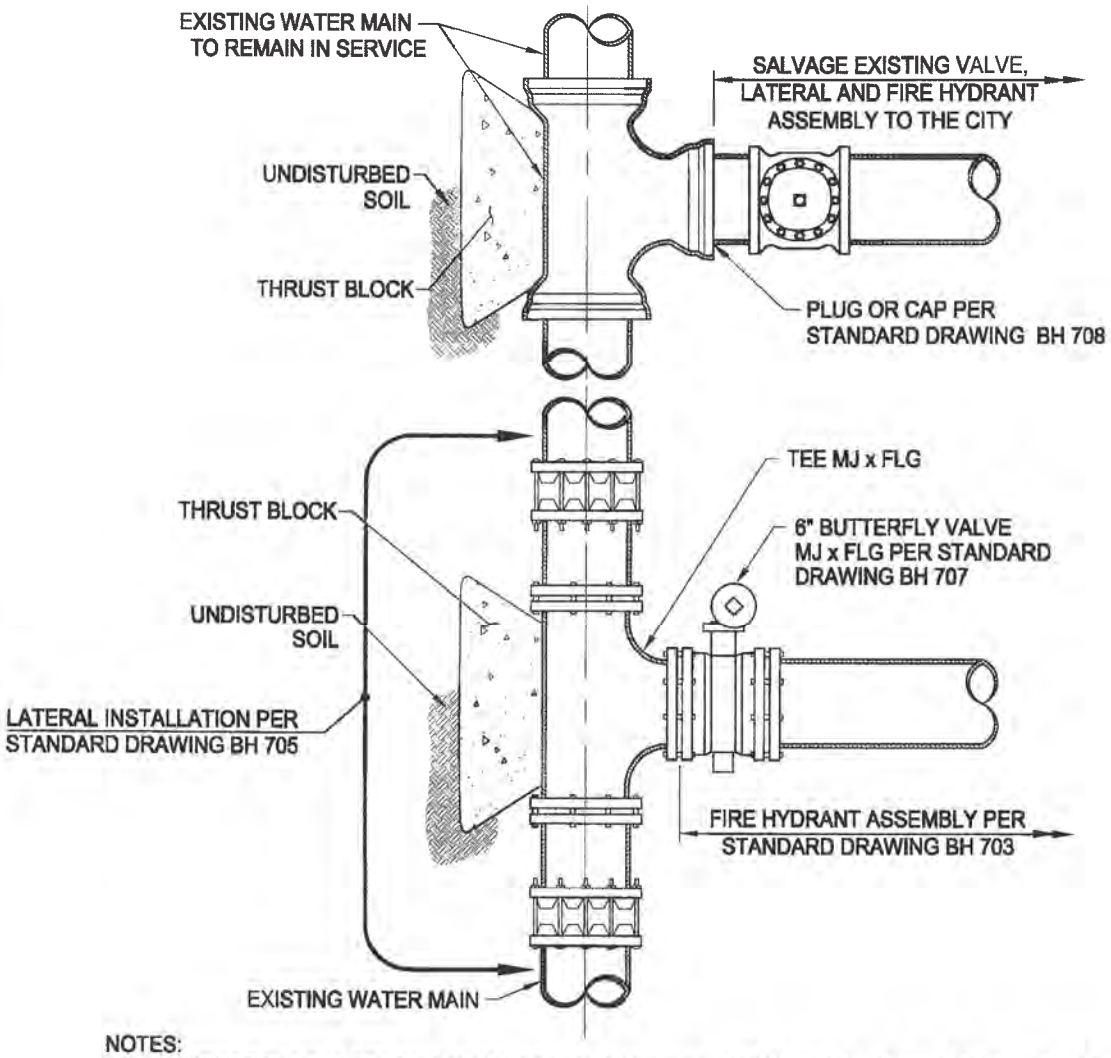
STANDARD DRAWING
**BH 705**
SHEET 1 OF 1




NOTES:

1. THRUST BLOCKS PER STANDARD DRAWING NUMBER BH 709, ARE REQUIRED AT ALL PLUGS, TEES AND ENDS, OR AS DIRECTED BY THE CITY ENGINEER.
2. EXPOSED BOLT AND NUT ASSEMBLIES ON FLEXIBLE COUPLINGS AND/OR MECHANICAL JOINT FITTINGS SHALL BE COATED WITH TAR BITUMASTIC ENAMEL PRIOR TO BACKFILL.
3. ALL PERMANENT PLUGS OR CAPS, PER STANDARD DRAWING NO. BH 708, SHALL BE CAPABLE OF WITHSTANDING A 200 PSI TEST PRESSURE.
4. FINAL FIRE HYDRANT LOCATION TO BE DETERMINED BY THE CITY ENGINEER.
5. REMOVE EXISTING TEE, VALVE, LATERAL AND FIRE HYDRANT ASSEMBLY IF LOCATION REMAINS THE SAME.
6. TRENCHES WITHIN THE ROADWAY FOR LATERAL INSTALLATIONS OR REMOVALS SHALL BE BACKFILLED WITH A SAND SLURRY MIX AS DIRECTED BY THE CITY ENGINEER.
7. SURFACE CONDITIONS SHALL BE RESTORED TO THE SATISFACTION OF THE CITY ENGINEER.

# CONNECTION FOR UPGRADED FIRE HYDRANT INSTALLATION

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**CITY OF BEVERLY HILLS, CALIFORNIA**

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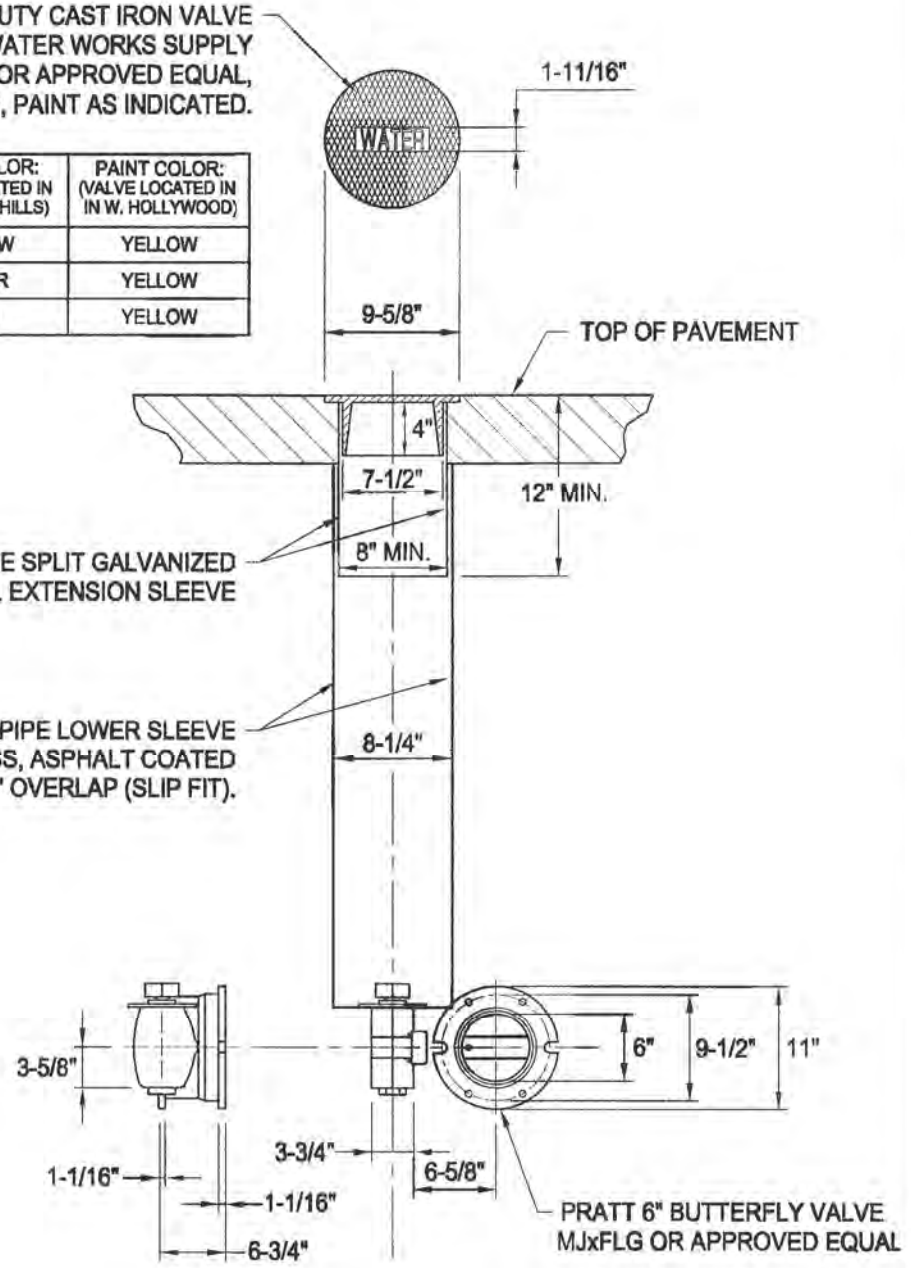
STANDARD DRAWING

**BH 706**

SHEET 1 OF 1

PROVIDE HEAVY DUTY CAST IRON VALVE BOX CAP, WESTERN WATER WORKS SUPPLY COMPANY, 8" I.D. NO. 84 OR APPROVED EQUAL, MARKED AS INDICATED, PAINT AS INDICATED.

| VALVE TYPE: | PAINT COLOR: (VALVE LOCATED IN IN BEVERLY HILLS) | PAINT COLOR: (VALVE LOCATED IN IN W. HOLLYWOOD) |
|---|---|---|
| WATER MAIN ISOLATION VALVE | YELLOW | YELLOW |
| FIRE HYDRANT BRANCH VALVE | SILVER | YELLOW |
| ZONE VALVE | RED | YELLOW |




NOTES:

1. VALVE OPERATORS SHALL BE A TRAVELING NUT TYPE AND HAVE 2-INCH OPERATING NUTS.
2. SURFACE CONDITIONS SHALL BE RESTORED TO THE SATISFACTION OF THE CITY ENGINEER.

# VALVE BOX DETAIL

| REVISIONS | | |
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| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**
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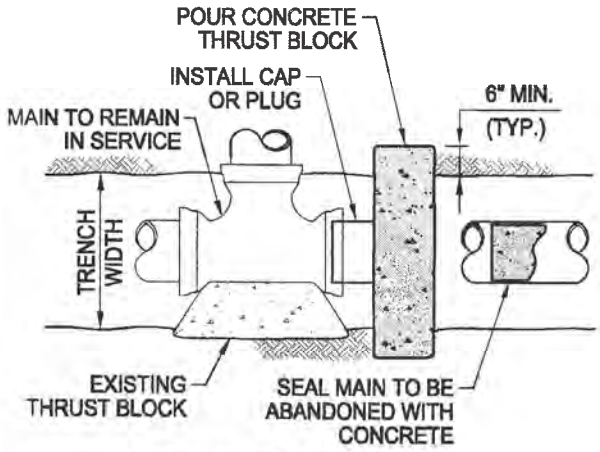
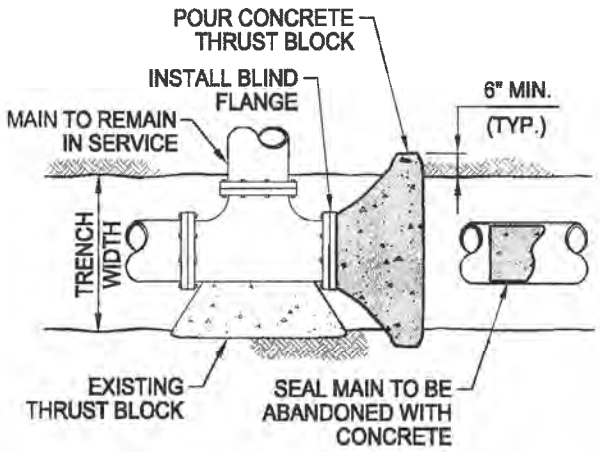
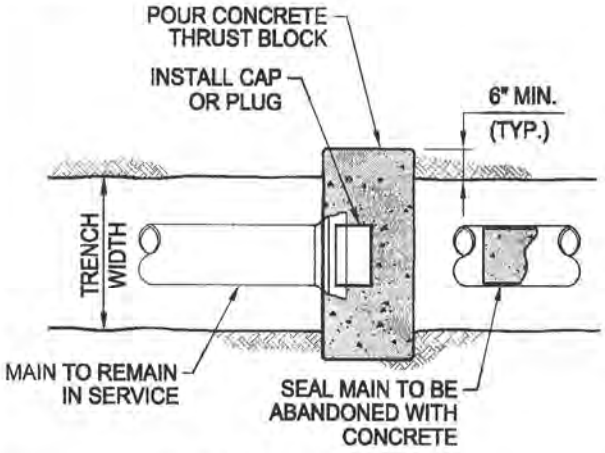
STANDARD DRAWING
**BH 707**
SHEET 1 OF 1



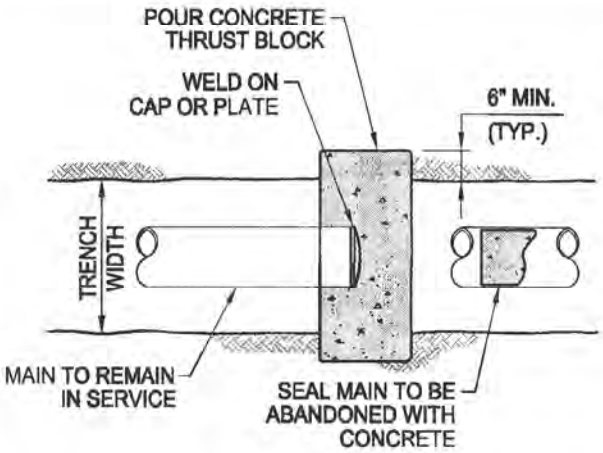

HUB-END OR RING-TITE FITTING OR VALVE




FLANGED FITTING OR VALVE




DUCTILE OR CAST IRON MAIN




STEEL MAIN

NOTES:

1. CONCRETE SHALL BE 2000 P.S.I.
2. POUR CONCRETE THRUST BLOCKS AGAINST UNDISTURBED SOIL.
3. REMOVE INTERFERING PORTIONS OF MAIN TO BE ABANDONED.
4. USE STEEL ANCHOR RODS OR STRAPS ONLY WHERE PERMITTED BY THE ENGINEER.

# TYPICAL CAPS AND PLUGS

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 7-30-09

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STANDARD DRAWING

**BH 708**

SHEET 1 OF 1

## HORIZONTAL BENDS

| NOMINAL PIPE SIZE (INCHES) | TEST PRESSURE (P.S.I.) | DEAD ENDS AND TEES | | | BENDS LESS THAN OR EQUAL TO ANGLE: | | | | | | | | ALL BENDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 11 - 1/4° | | 22 - 1/2° | | 45° | | 90° | | |
| | | A | B | C | A | B | A | B | A | B | A | B | C |
| 6 | 200 | 2'-6" | 1'-6" | 6" | 1'-0" | 1'-0" | 2'-0" | 1'-0" | 3'-0" | 1'-0" | 3'-6" | 1'-6" | 8" |
| 8 | 200 | 4'-6" | 1'-6" | 8" | 1'-6" | 1'-0" | 3'-0" | 1'-0" | 3'-6" | 1'-6" | 5'-0" | 2'-0" | 10" |
| 10 | 200 | 5'-6" | 2'-0" | 10" | 2'-0" | 1'-0" | 3'-0" | 1'-6" | 4'-0" | 2'-0" | 6'-0" | 2'-6" | 1'-0" |
| 12 | 200 | 7'-6" | 2'-0" | 1-0" | 2'-0" | 1'-6" | 3'-0" | 2'-0" | 4'-6" | 2'-6" | 7'-0" | 3'-0" | 1'-0" |

## VERTICAL BENDS

| NOMINAL PIPE SIZE (INCHES) | TEST PRESSURE (P.S.I.) | BENDS LESS THAN OR EQUAL TO ANGLE: | | | | | | | | | | | | ALL BENDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 11 - 1/4° | | | 22 - 1/2° | | | 45° | | | 90° | | | |
| | | D | E | F | D | E | F | D | E | F | D | E | F | C |
| 6 | 200 | 1'-6" | 3'-0" | 1'-0" | 2'-0" | 4'-0" | 1'-0" | 3'-0" | 5'-6" | 1'-0" | 4'-0" | 7'-0" | 2'-0" | 8" |
| 8 | 200 | 2'-0" | 4'-0" | 1'-0" | 2'-6" | 5'-0" | 1'-0" | 3'-6" | 7'-0" | 2'-0" | 5'-0" | 10'-0" | 3'-6" | 10" |
| 10 | 200 | 2'-0" | 4'-6" | 1'-0" | 3'-0" | 6'-0" | 1'-6" | 4'-0" | 9'-0" | 3'-0" | 6'-0" | 12'-0" | 5'-0" | 1'-0" |
| 12 | 200 | 2'-6" | 5'-0" | 1'-0" | 3'-6" | 7'-0" | 2'-0" | 5'-0" | 10'-0" | 4'-0" | 7'-0" | 14'-0" | 7'-0" | 1'-0" |

## CONCRETE THRUST BLOCK SCHEDULE

NOTE:

1. THRUST BLOCK SIZES ARE BASED ON A BEARING CAPACITY OF 1500 P.S.F., WITH A MINIMUM SOIL COVER OF 3'-0". IF SOIL COVER IS LESS THAN 3'-0", MULTIPLY BEARING AREA BY A FACTOR OR 1.5 FOR SOIL COVER OF 2'-0" TO 3'-0", OR BY A FACTOR OF THREE (3) FOR SOIL COVER OF 1'-0" TO 2'-0".
2. DIMENSIONS SHOWN REFER TO THRUST BLOCK TYPES SHOWN IN DETAIL, AND ARE MINIMUM VALUES ONLY.
3. CONCRETE MIX SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR 3000 LBS. STRENGTH AT 28 DAYS WHEN TESTED IS ACCORDANCE WITH ASTM 039.
4. ALL THRUST BLOCKS SHALL BE POURED SOLIDLY AGAINST FIRM, UNDISTURBED SOIL.
5. IF SOILS HAVE BEEN PREVIOUSLY EXCAVATED AND BACKFILLED, CONTRACTOR SHALL NOTIFY CITY ENGINEER, WHO MAY DIRECT THAT THE DIMENSIONS SHOWN SHALL BE INCREASED BY A FACTOR OF 1.5.
6. CONCRETE POURED AGAINST PIPE FITTINGS SHALL NOT EXTEND BEYOND THE FITTING JOINTS WITHOUT THE APPROVAL OF THE CITY ENGINEER.
7. THRUST REACTION BACKING TYPE (SEE DRAWING) SHALL BE AS DIRECTED BY THE CITY ENGINEER.
8. THE ANGLE (Θ) SHOWN IN THE DETAILS SHALL BE GREATER THAN 45° IN ALL CASES.

# CONCRETE THRUST BLOCKS

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

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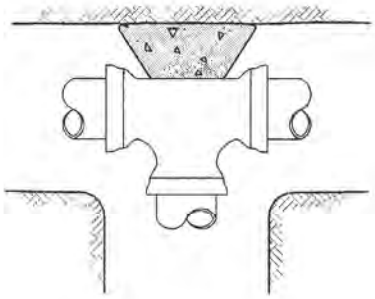
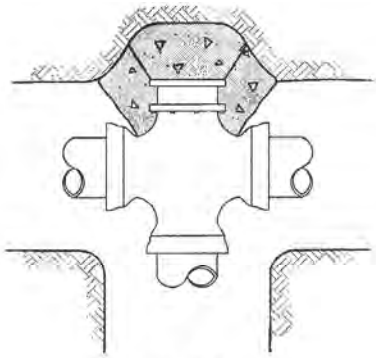
STANDARD DRAWING

**BH 709**

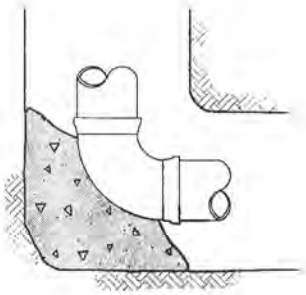
SHEET 1 OF 4



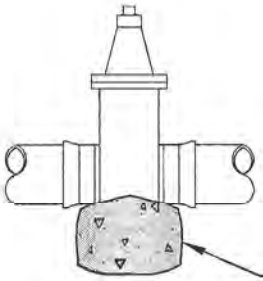
TEE



CROSS



90 DEGREE ELBOW



GATE VALVE

FOR AREA ON SIDE FACES USE VALVES REQUIRED FOR TEES

NOTE:

1. CONCRETE FOR THRUST BLOCK TO BE 2000 P.S.I.

# CONCRETE THRUST BLOCKS

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

## CITY OF BEVERLY HILLS, CALIFORNIA

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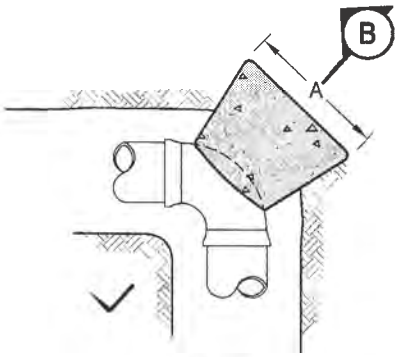
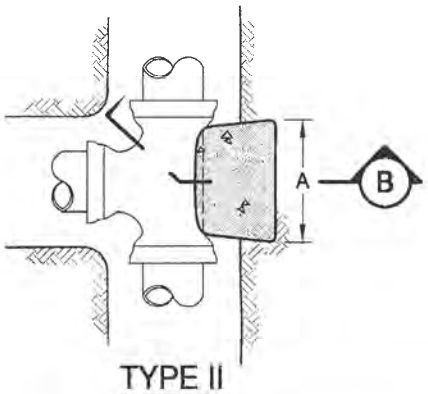
STANDARD DRAWING

**BH 709**

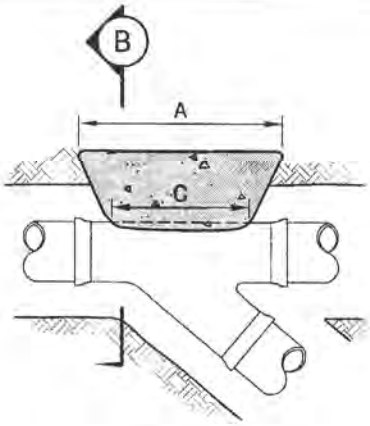
SHEET 2 OF 4



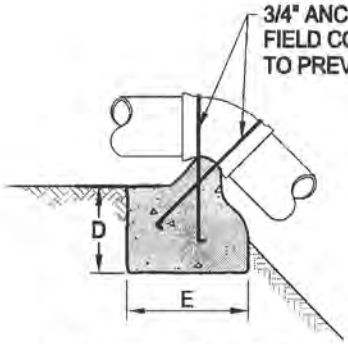

TYPE I




TYPE II

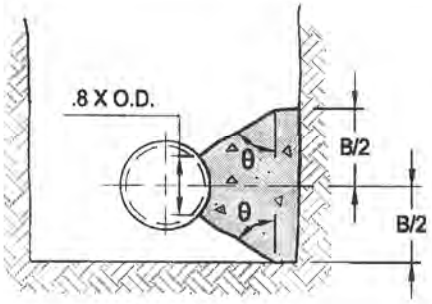



TYPE III




MAKE BLOCK WIDTH OF TRENCH

TYPE IV




SECTION B

NOTE:

1. SEE STANDARD DRAWING NO. BH 711, SHT. 1 FOR THRUST BLOCK SCHEDULE AND NOTES.

# CONCRETE THRUST BLOCKS

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

**CITY OF BEVERLY HILLS, CALIFORNIA**

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CIVIL ENGINEERING DIVISION

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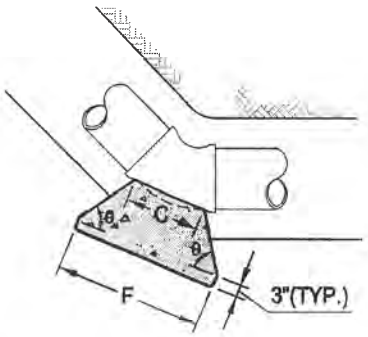
STANDARD DRAWING

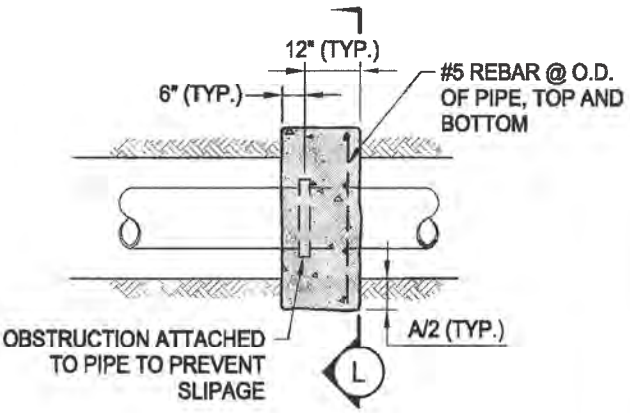
**BH 709**

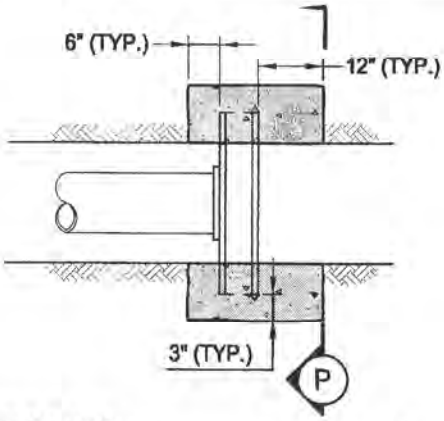
SHEET 3 OF 4

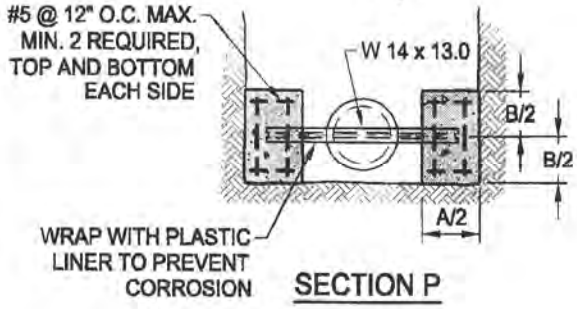



MAKE BLOCK FULL WIDTH OF TRENCH

TYPE V

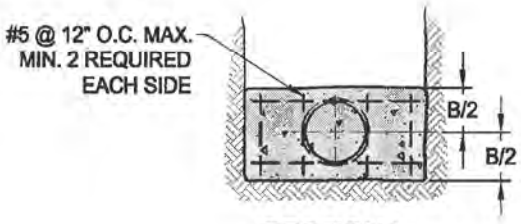



SECTION P

TYPE VII




SECTION L

TYPE VI

NOTE:

1. SEE STANDARD DRAWING NO.BH 711, SHT. 1 FOR THRUST BLOCK SCHEDULE AND NOTES.

# CONCRETE THRUST BLOCKS

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

**CITY OF BEVERLY HILLS, CALIFORNIA**

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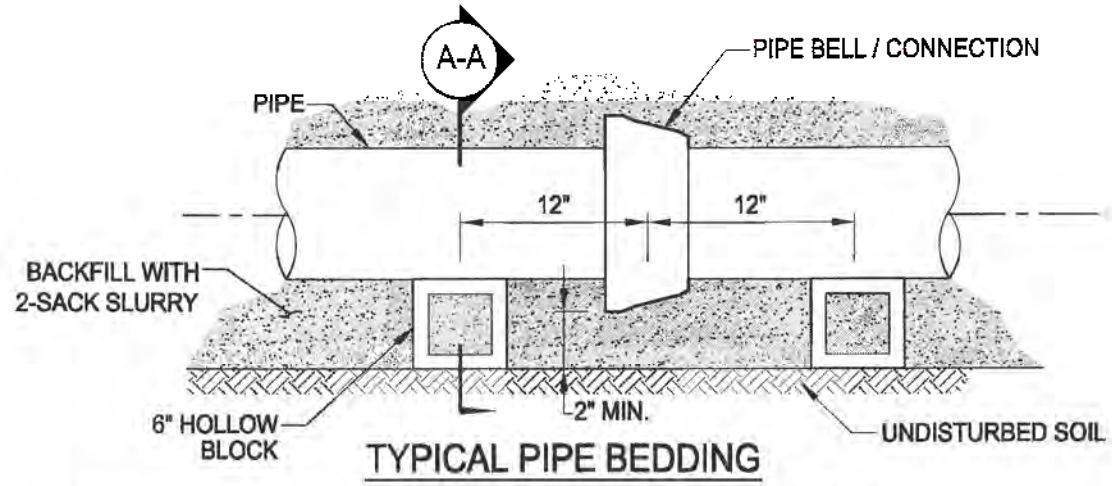
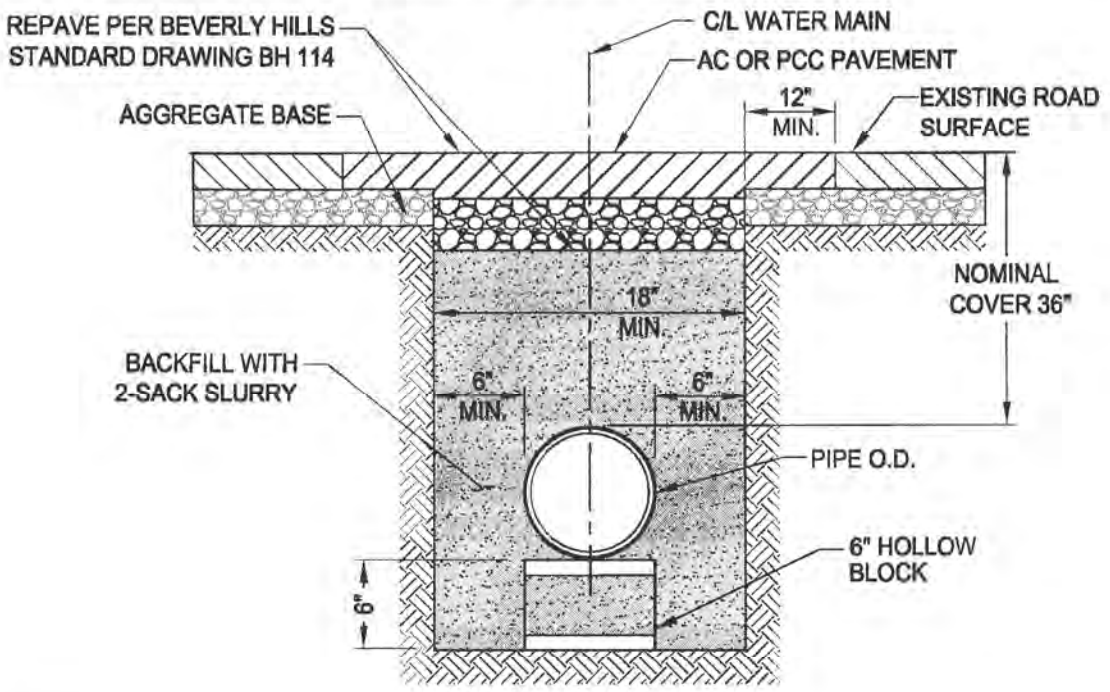
STANDARD DRAWING

**BH 709**

SHEET 4 OF 4




## TYPICAL PIPE BEDDING




## TRENCH SECTION "A-A"

NOT TO SCALE

NOTES:

1. WHEN TRENCH WORK CAN NOT BE COMPLETED WITHIN THE SAME WORKING DAY SEE BEVERLY HILLS STANDARD DRAWING BH 113 FOR STEEL PLATE PLACEMENT.
2. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("GREENBOOK").

# TRENCH FOR WATER LINE

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

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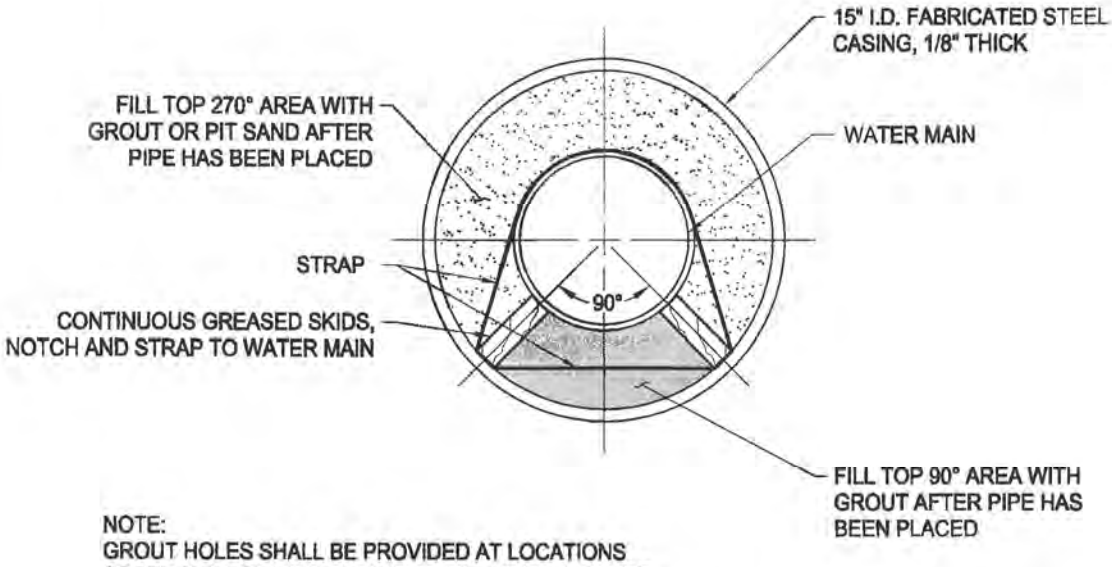
STANDARD DRAWING
**BH 710**
SHEET 1 OF 1




NOTE:
GROUT HOLES SHALL BE PROVIDED AT LOCATIONS ACCEPTABLE TO THE ENGINEER. FILL VOIDS OUTSIDE CASING PIPE WITH GROUT.

## JACKED CASING WITH WATER MAIN
NOT TO SCALE

# JACKED CASING WITH WATER MAIN DETAIL

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

**CITY OF BEVERLY HILLS, CALIFORNIA**
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RECOMMENDED _____ CITY ENGINEER DATE 7-30-09

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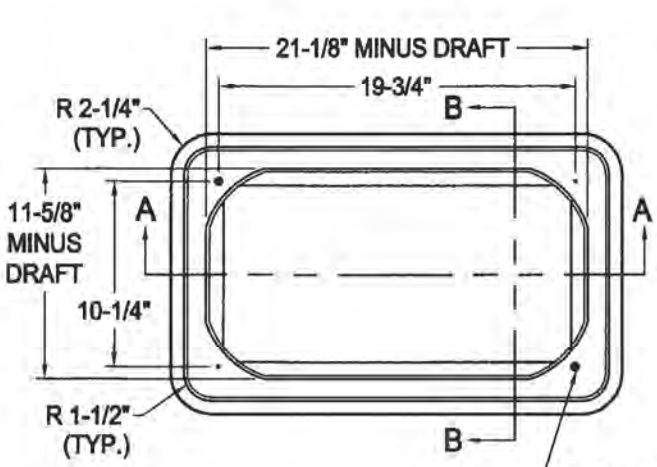
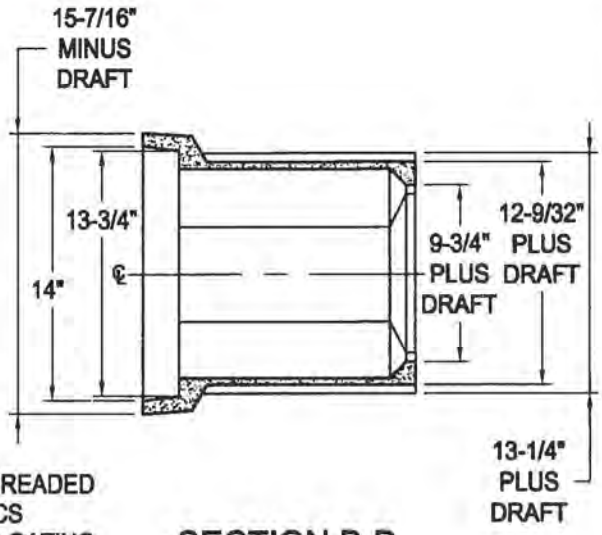
STANDARD DRAWING
**BH 711**
SHEET 1 OF 1

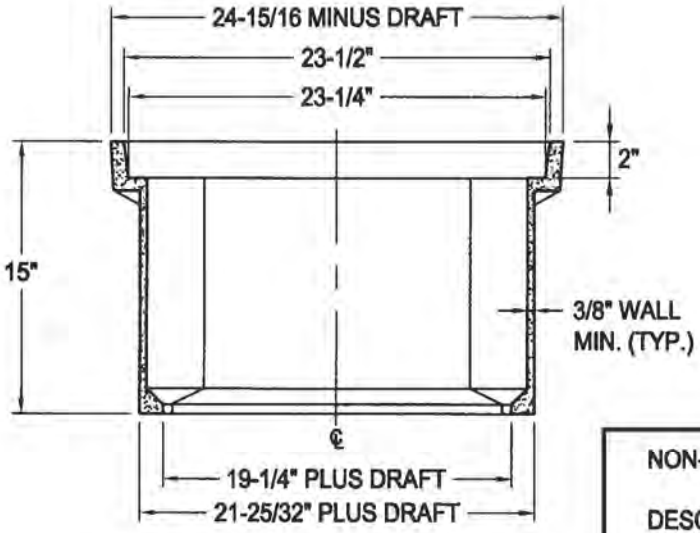



PLAN VIEW

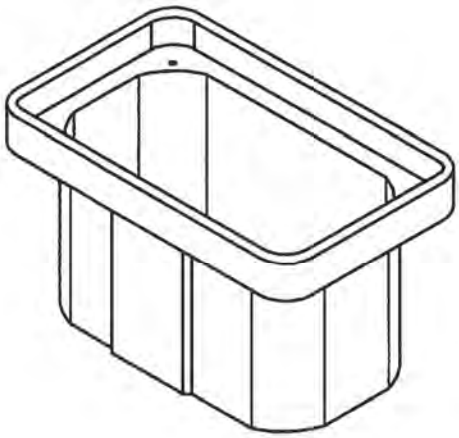



SECTION B-B

3/8-16 SST THREADED INSERT, 2 PLCS (4 PLCS OR FLOATING NUT ALSO AVAILABLE)




SECTION A-A



NON-TRAFFIC RATED

| | |
|---|---|
| DESCRIPTION OF MATERIAL: | POLYMER CONCRETE (GRAY) |
| TOLERANCE: | ±1/8" |
| ESTIMATED PART WEIGHT: | 65.0 LBS. |

# WATER METER BOX & LID - 13" x 24"

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

## CITY OF BEVERLY HILLS, CALIFORNIA

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

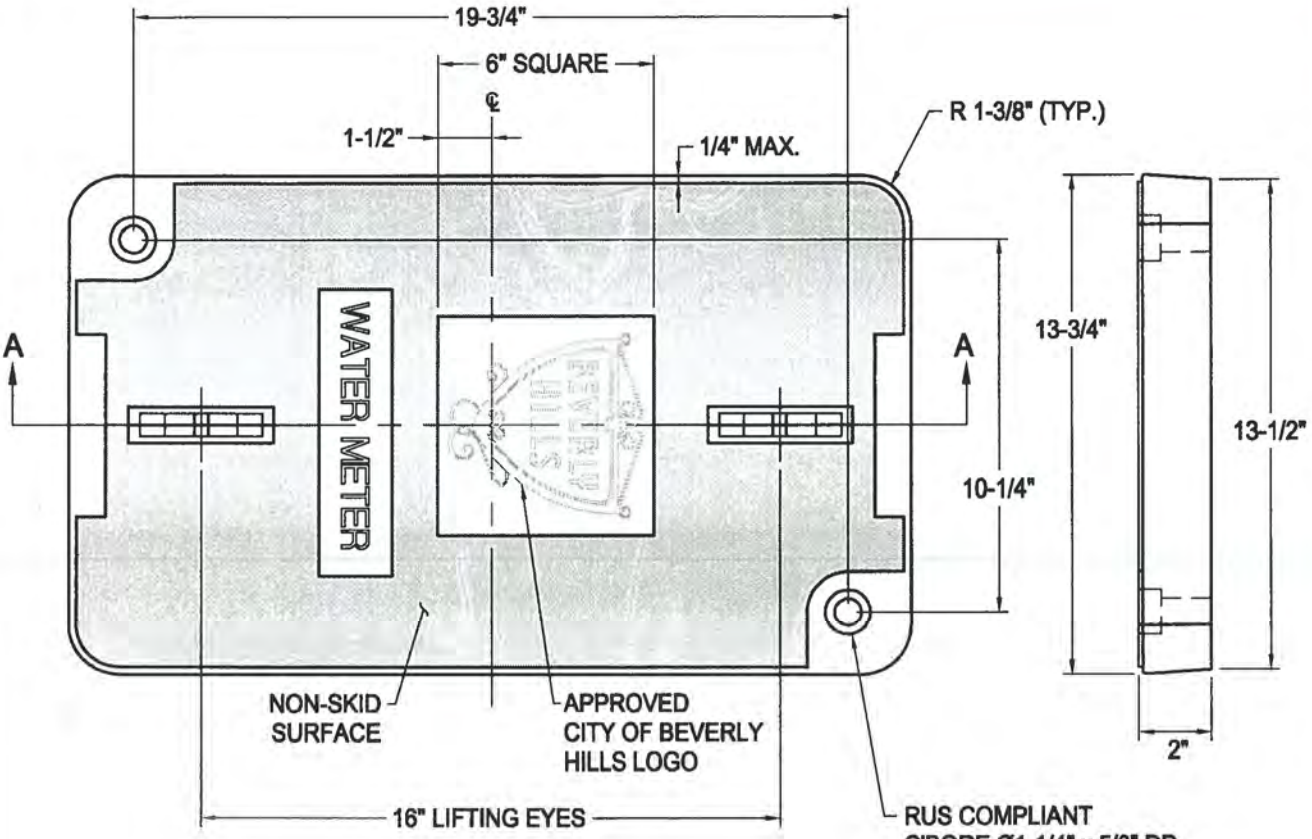
RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

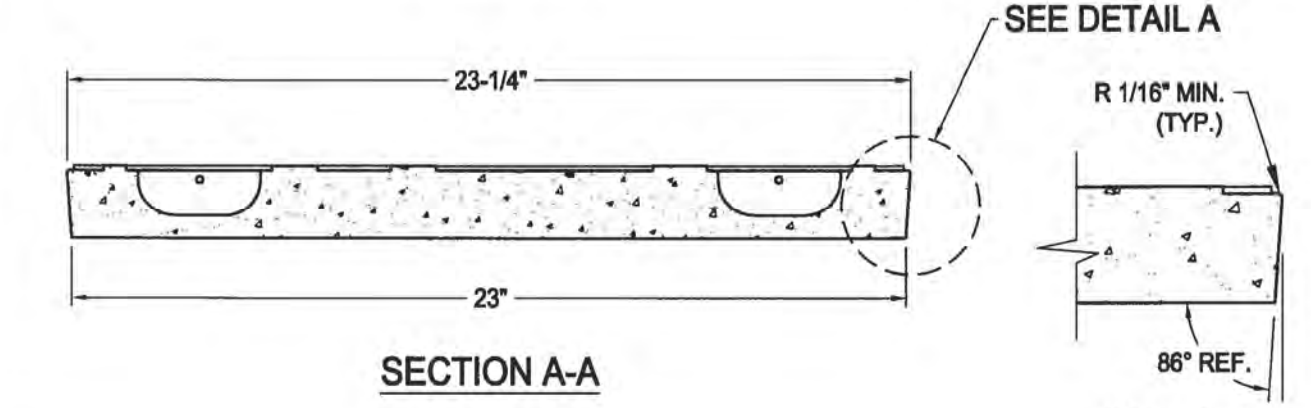
STANDARD DRAWING

**BH 712**

SHEET 1 OF 2




PLAN VIEW




SECTION A-A

DETAIL A

# WATER METER BOX & LID - 13" x 24"

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

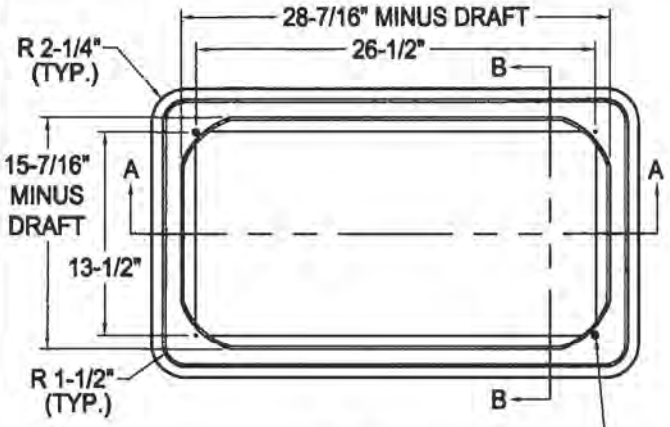
RECOMMENDED _____ CITY ENGINEER DATE 11-8-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

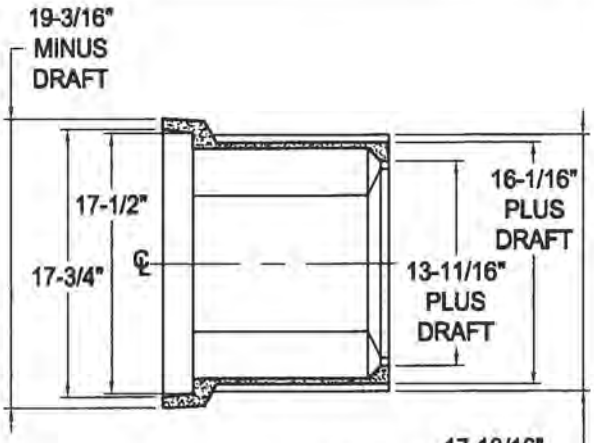
STANDARD DRAWING

**BH 712**

SHEET 2 OF 2

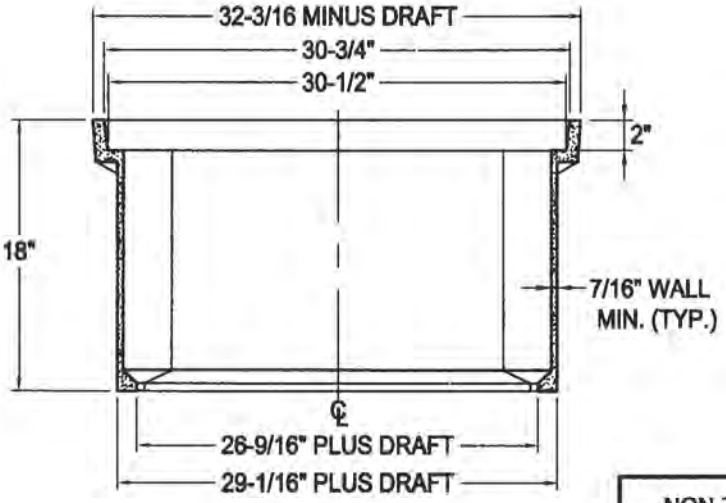



PLAN VIEW

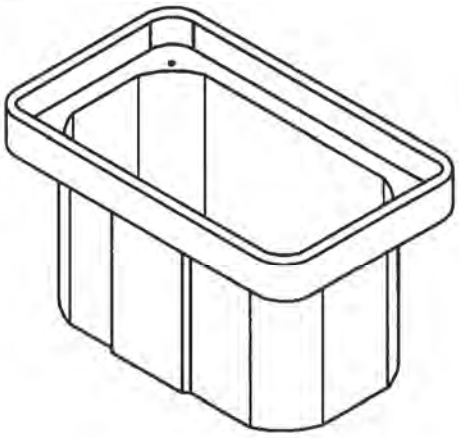



SECTION B-B

3/8-16 SST THREADED INSERT, 2 PLCS (4 PLCS OR FLOATING NUT ALSO AVAILABLE)




SECTION A-A



NON-TRAFFIC RATED

| | |
|---|---|
| DESCRIPTION OF MATERIAL: | POLYMER CONCRETE (GRAY) |
| TOLERANCE: | ±1/8" |
| ESTIMATED PART WEIGHT: | 99.0 LBS. |

# WATER METER BOX & LID - 17" x 30"

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

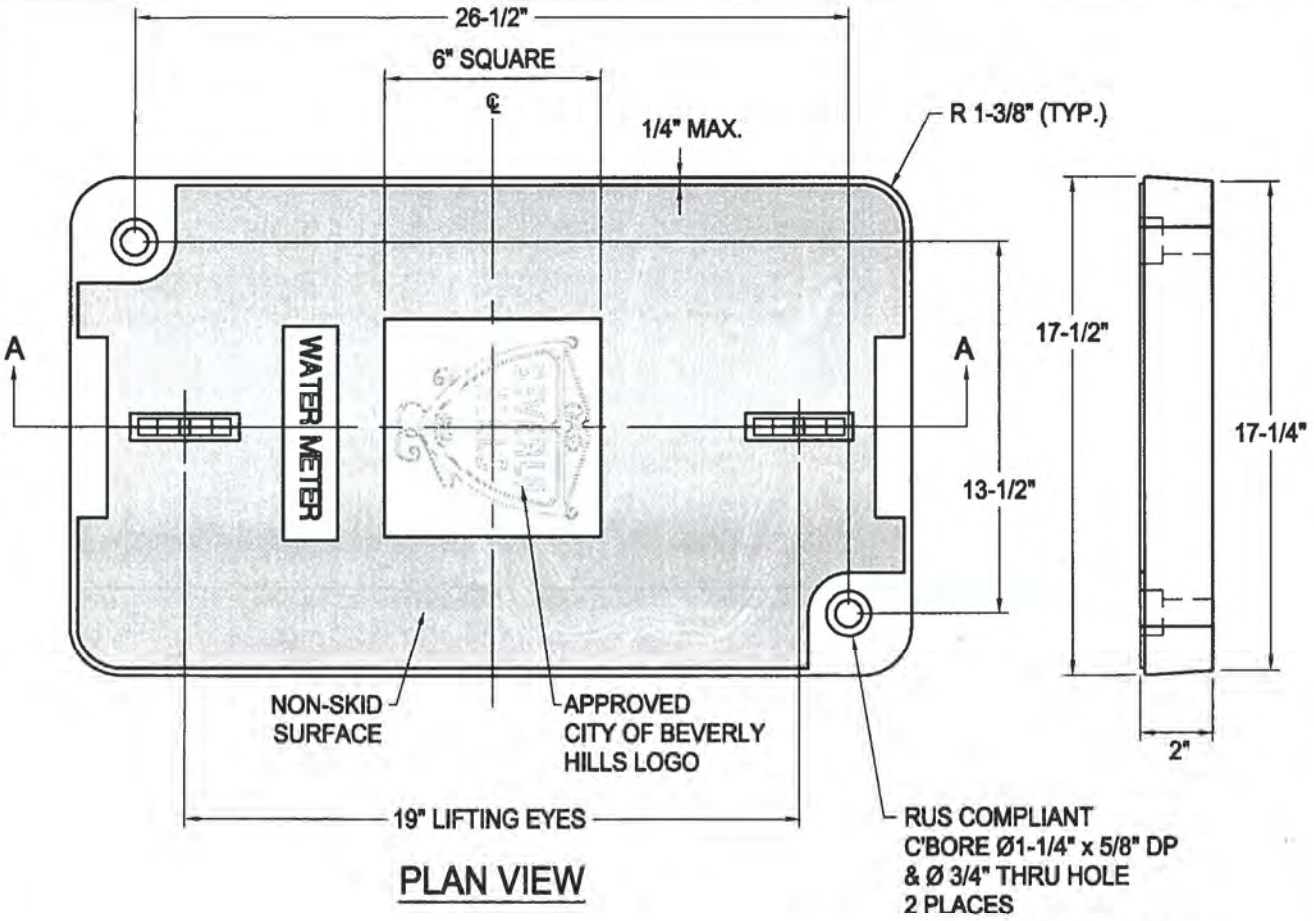
## CITY OF BEVERLY HILLS, CALIFORNIA

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

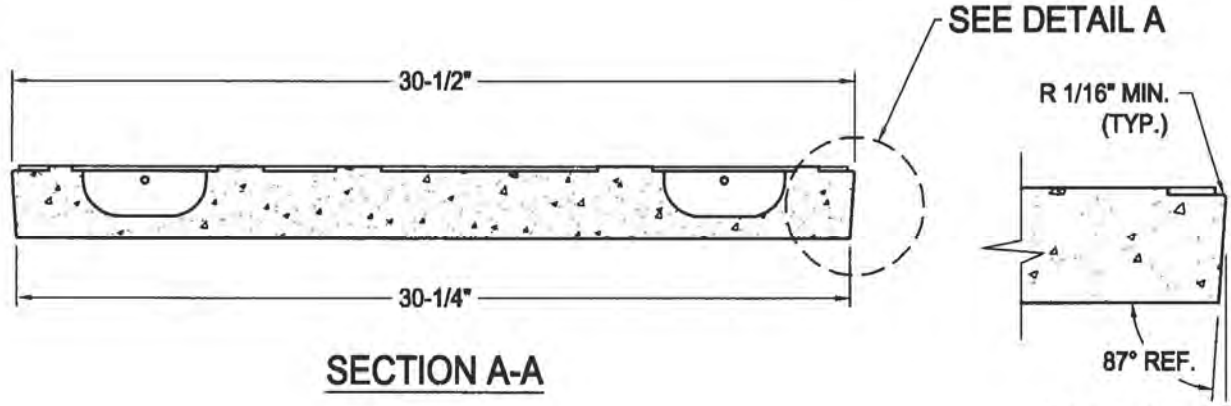
RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

STANDARD DRAWING
**BH 713**
SHEET 1 OF 2




PLAN VIEW




SECTION A-A

DETAIL A

# WATER METER BOX & LID - 17" x 30"

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

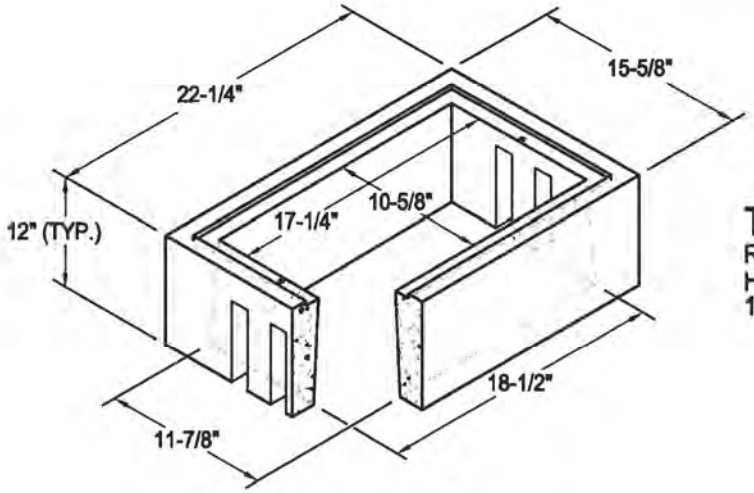
RECOMMENDED _____ CITY ENGINEER DATE 11-18-16

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-16

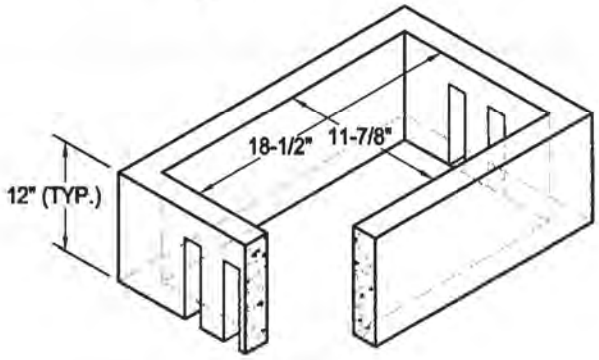
STANDARD DRAWING

**BH 713**

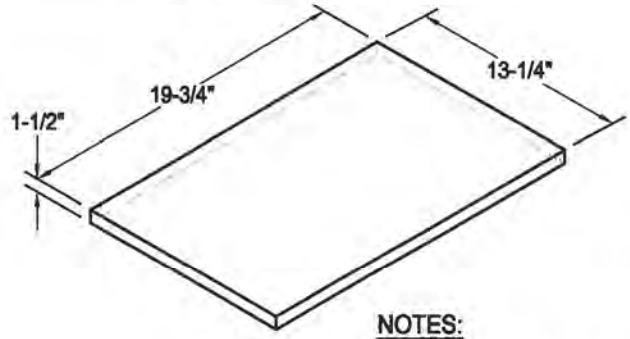
SHEET 2 OF 2




**TRAFFIC BOX**
REINFORCED CONCRETE
H-20 LOADING
130 lbs.




**EXTENSION**
REINFORCED CONCRETE
H-20 LOADING
129 lbs.




**SLAB**
REINFORCED CONCRETE
32 lbs.

NOTES:

1. CALTRANS No. 3-1/2T STATE SPECIFICATIONS.

# 10" x 17" WATER METER BOX & LID - H/20 LOADING

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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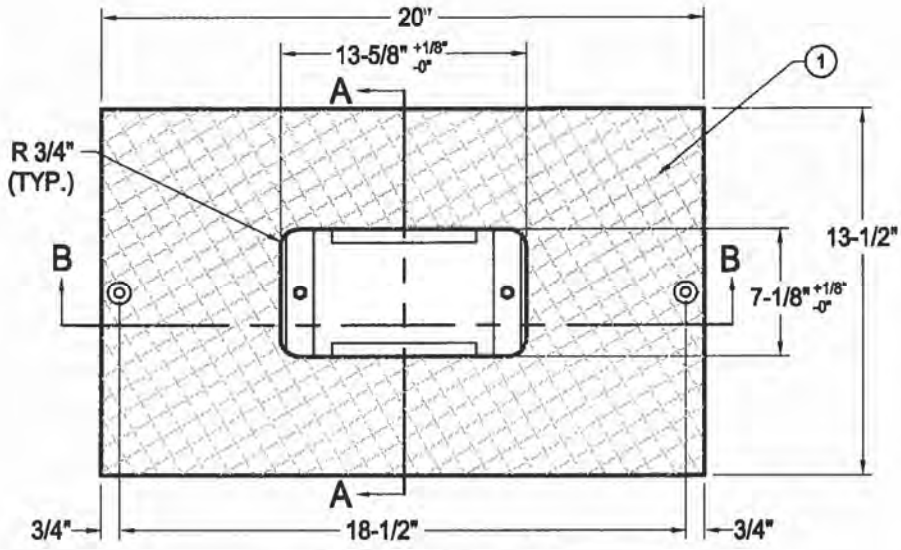
**CITY OF BEVERLY HILLS, CALIFORNIA**
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

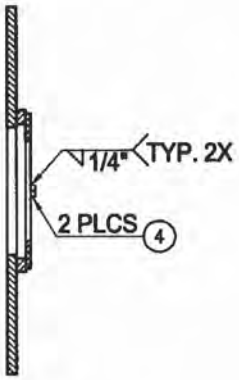
RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11.18.10

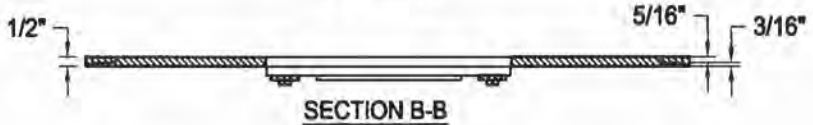
STANDARD DRAWING
**BH 714**
SHEET 1 OF 2



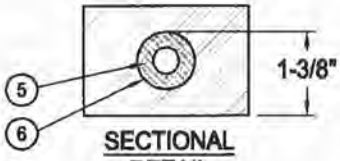

PLAN VIEW



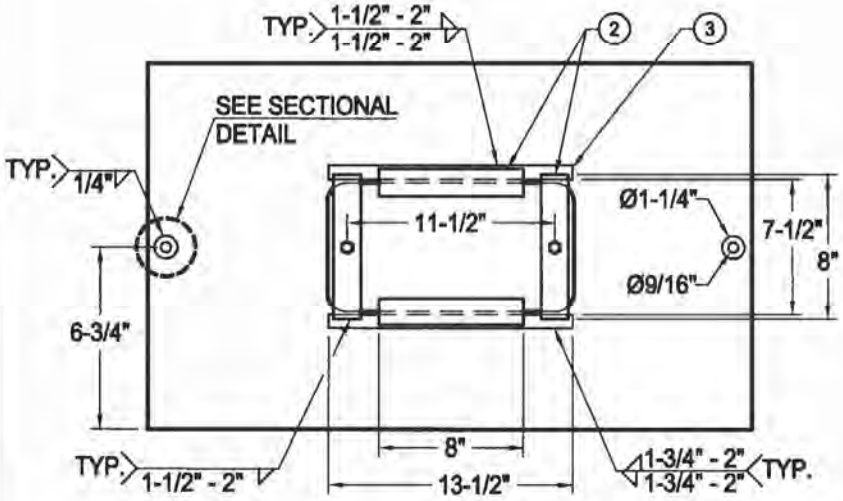

SECTION A-A




SECTION B-B




SECTIONAL DETAIL




**MATERIALS**

1. - 1/2" DIAMOND CHECKER PLATE
2. - 1/4" x 1-1/2" STEEL FLAT STOCK
3. - 3/4" x 1/2" STEEL FLAT STOCK
4. - 3/8" - 16 STEEL NUT
5. - 3/16" THICK WASHER TO BE WELDED PER ASTM A-706
6. - SURFACE AROUND WELD TO BE FLAT

# 10" x 17" WATER METER BOX & LID - H/20 LOADING

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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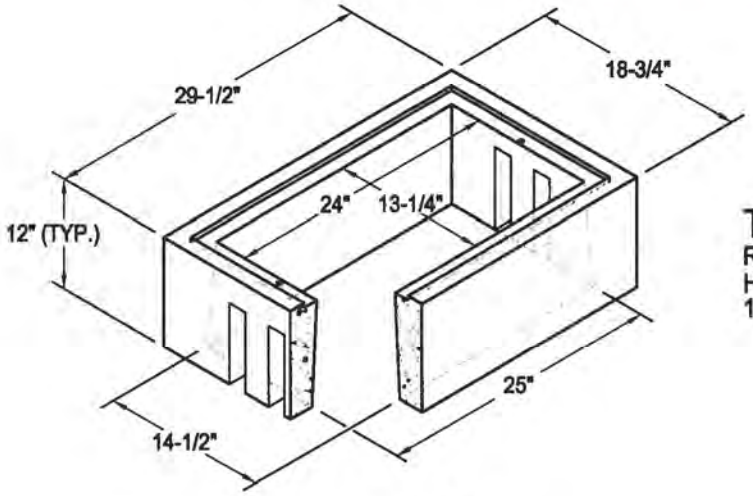
## CITY OF BEVERLY HILLS, CALIFORNIA

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

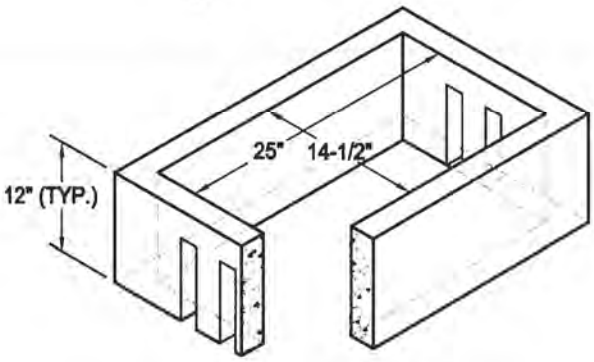
RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

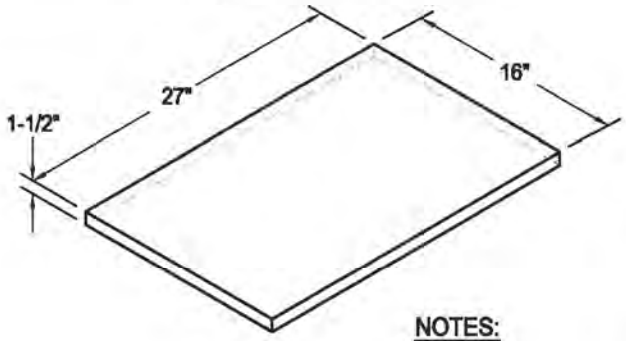
STANDARD DRAWING
**BH 714**
SHEET 2 OF 2




**TRAFFIC BOX**
REINFORCED CONCRETE
H-20 LOADING
166 lbs.




**EXTENSION**
REINFORCED CONCRETE
H-20 LOADING
163 lbs.




**SLAB**
REINFORCED CONCRETE
52 lbs.

NOTES:

1. CALTRANS No. 5T STATE SPECIFICATIONS.

# 13" x 24" WATER METER BOX & LID - H/20 LOADING

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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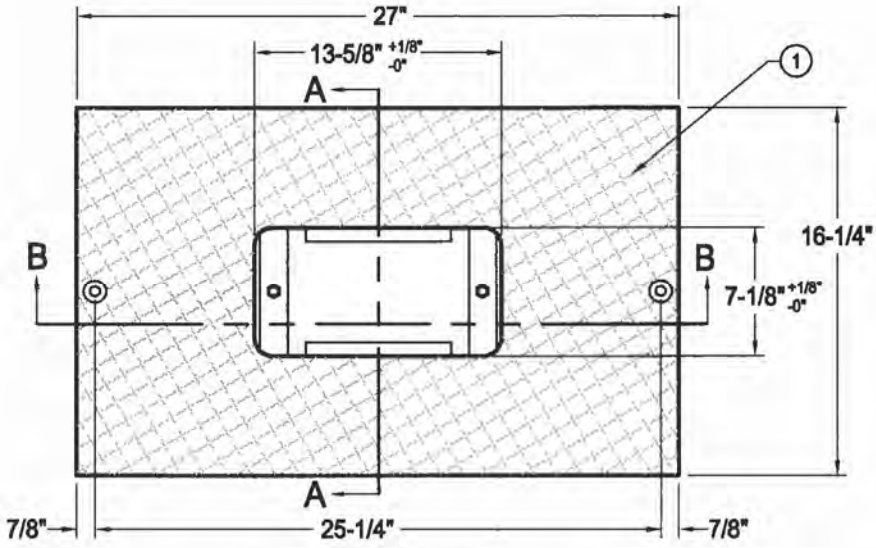
**CITY OF BEVERLY HILLS, CALIFORNIA**
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

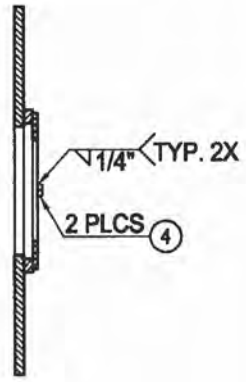
RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

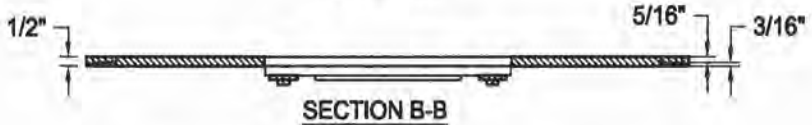
STANDARD DRAWING
**BH 715**
SHEET 1 OF 2



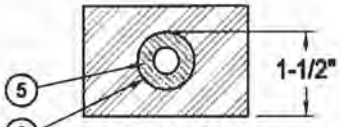

PLAN VIEW



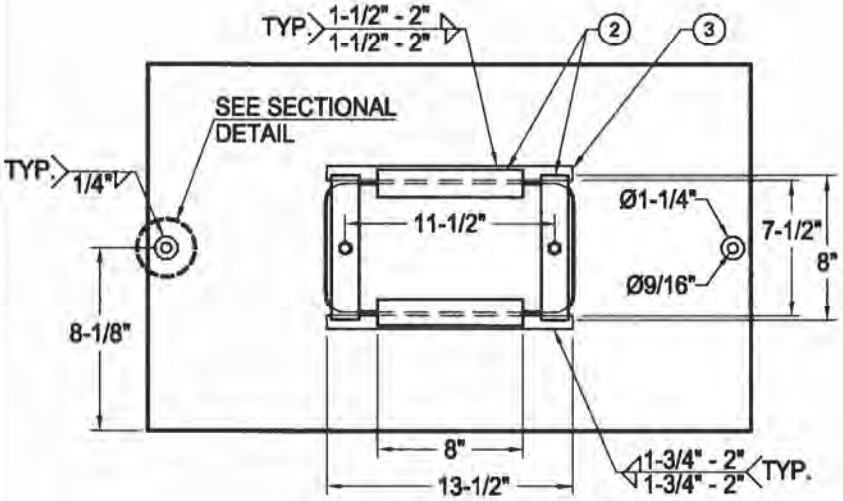

SECTION A-A




SECTION B-B




SECTIONAL DETAIL




MATERIALS

1. 1/2" DIAMOND CHECKER PLATE
2. 1/4" x 1-1/2" STEEL FLAT STOCK
3. 3/4" x 1/2" STEEL FLAT STOCK
4. 3/8" - 16 STEEL NUT
5. 3/16" THICK WASHER TO BE WELDED PER ASTM A-706
6. SURFACE AROUND WELD TO BE FLAT

# 13" x 24" WATER METER BOX & LID - H/20 LOADING

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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## CITY OF BEVERLY HILLS, CALIFORNIA

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

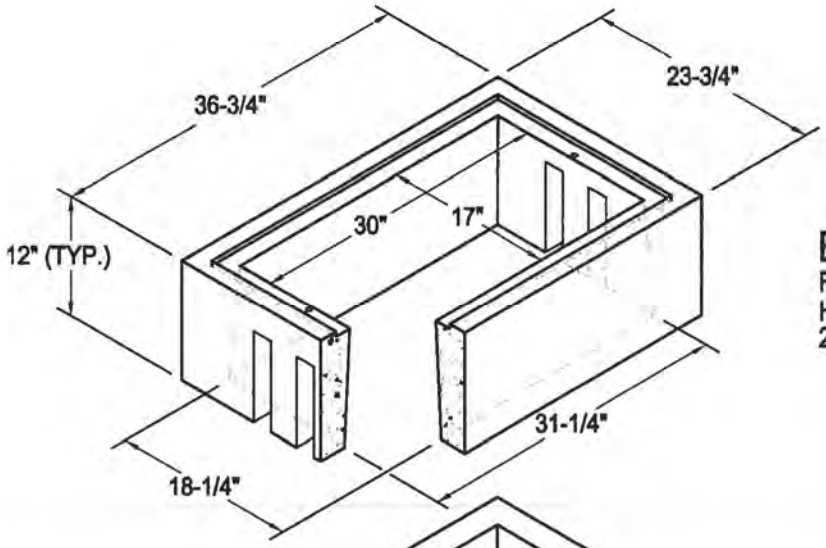
RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

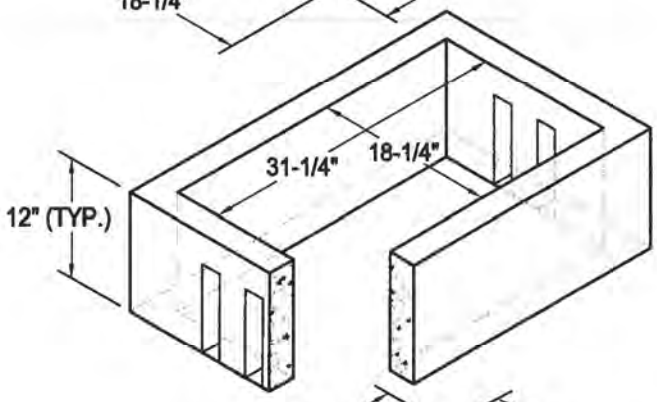
STANDARD DRAWING

**BH 715**

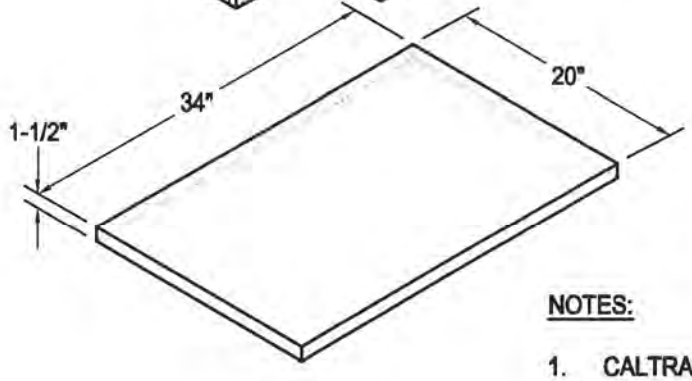
SHEET 2 OF 2




**BOX**
REINFORCED CONCRETE
H-20 LOADING
268 lbs.




**EXTENSION**
REINFORCED CONCRETE
H-20 LOADING
250 lbs.




**SLAB**
REINFORCED CONCRETE
108 lbs.

NOTES:

1. CALTRANS No. 6T STATE SPECIFICATIONS.

# 17" x 30" WATER METER BOX & LID - H/20 LOADING

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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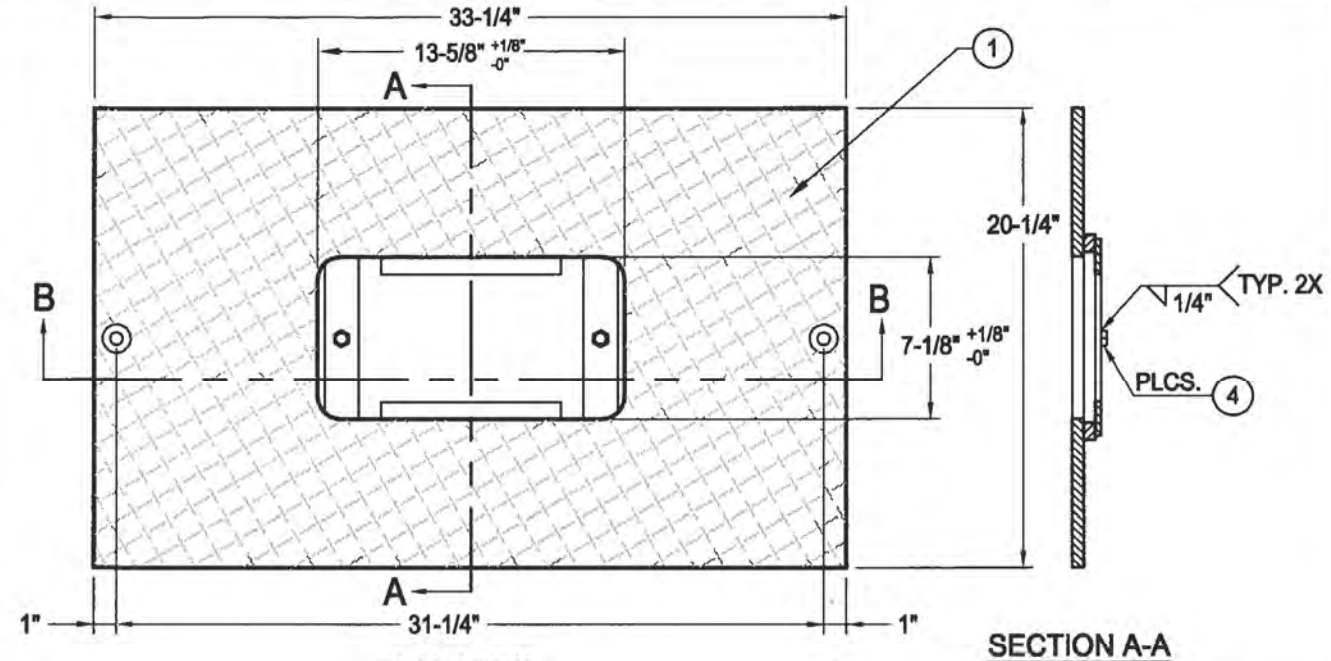
**CITY OF BEVERLY HILLS, CALIFORNIA**
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

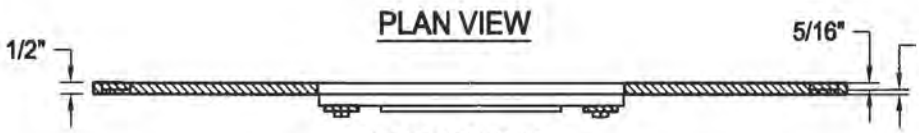
RECOMMENDED _____ DATE 11-18-10
CITY ENGINEER

APPROVED _____ DATE 11-18-10
PUBLIC WORKS DIRECTOR

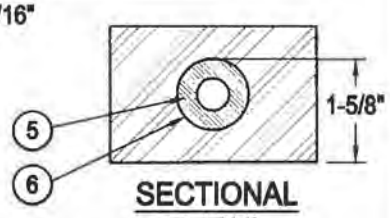
STANDARD DRAWING
**BH 716**
SHEET 1 OF 2




PLAN VIEW

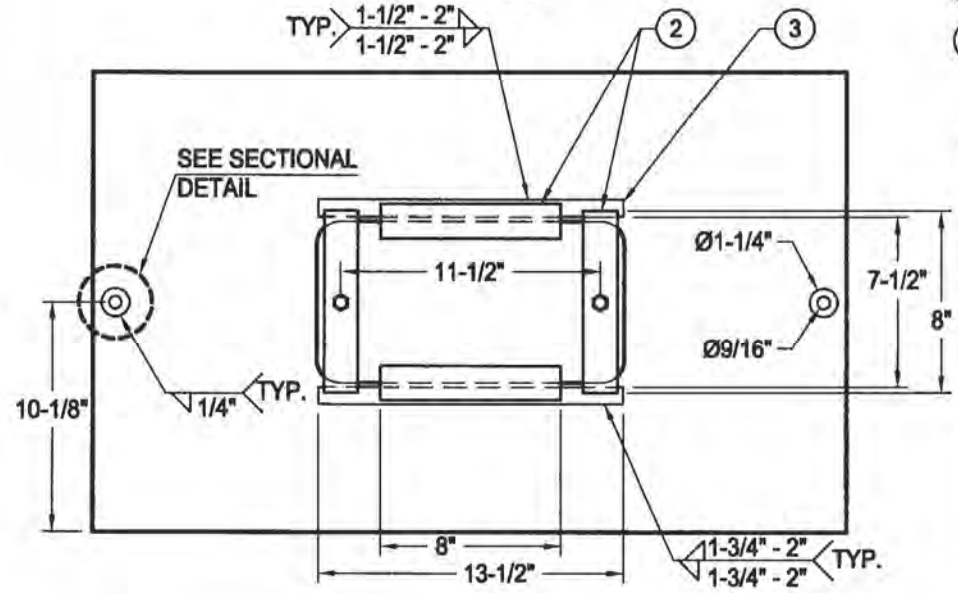



SECTION A-A




SECTIONAL DETAIL

SECTION B-B




**MATERIALS**

1. 1/2" DIAMOND CHECKER PLATE
2. 1/4" x 1-1/2" STEEL FLAT STOCK
3. 3/4" x 1/2" STEEL FLAT STOCK
4. 3/8" - 16 STEEL NUT
5. 3/16" THICK WASHER TO BE WELDED PER ASTM A-706
6. SURFACE AROUND WELD TO BE FLAT

# 17" x 30" WATER METER BOX & LID - H/20 LOADING

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

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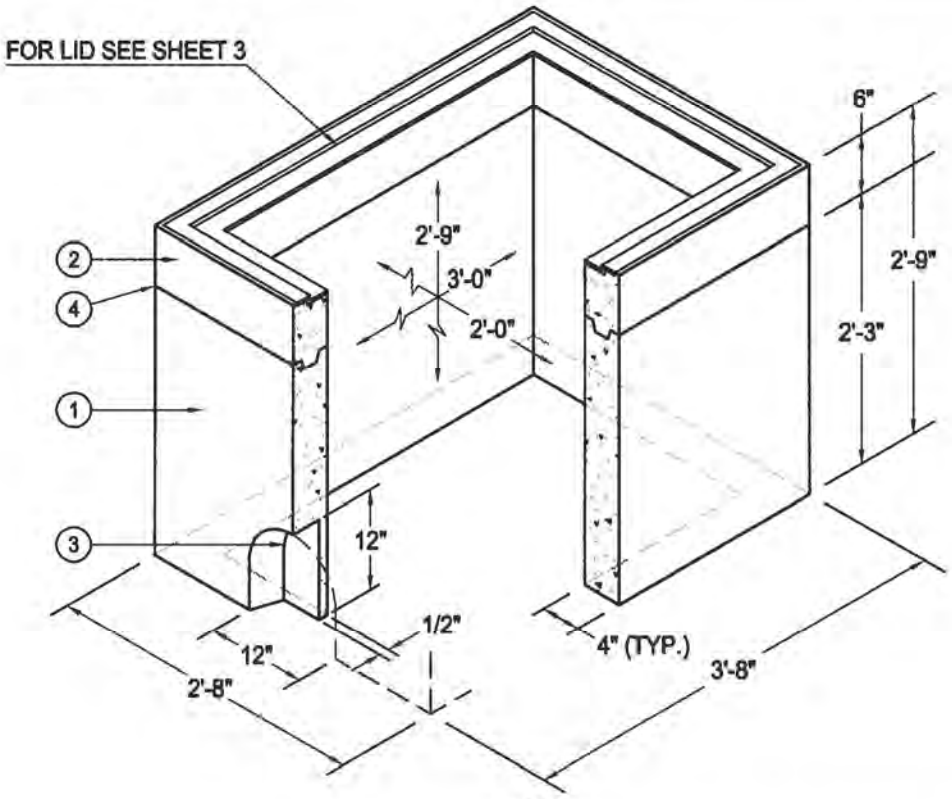
STANDARD DRAWING

**BH 716**

SHEET 2 OF 2




MATERIALS:

(1) 27" HIGH LOWER SECTION.

(2) 6" TOP SECTION WITH GALVANIZED CAST-IN FRAME.

(3) 12" x 12" KNOCK OUT x 3-1/2" DEEP ON EACH END WALL

(4) 6" OR 12" EXTENSION SECTIONS AVAILABLE.

NOTES:

1. DESIGNED FOR PEDESTRIAN/PARKWAY LOADS OR TRAFFIC AASHTO H20 FOR USE IN OFF-STREET LOCATIONS ONLY.

   STRUCTURE DESIGNED IN ACCORDANCE WITH:

   - AASHTO H-20 TRAFFIC BRIDGE LOADING

   - ASTM C-857 STANDARD PRACTICE FOR MINIMUM STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES

   - AMERICAN CONCRETE INSTITUTE ACI 318-05

2. CONCRETE COMPRESSIVE STRENGTH F'c = 5500 PSI.

3. REINFORCEMENT IN ACCORDANCE WITH ASTM A-706 WITH A YIELD STRENGTH OF Fy = 60,000 PSI.

4. 6" MINIMUM COMPACTED GRANULAR MATERIAL RECOMMENDED FOR SUB-BASE FOR EASE OF INSTALLATION AND EVEN LOAD DISTRIBUTION.

5. MINIMUM EXCAVATION SIZE: 3'-2" x 4'-2" x REQUIRED DEPTH.

# 2' x 3' WATER VAULT BOX & LID

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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## CITY OF BEVERLY HILLS, CALIFORNIA

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

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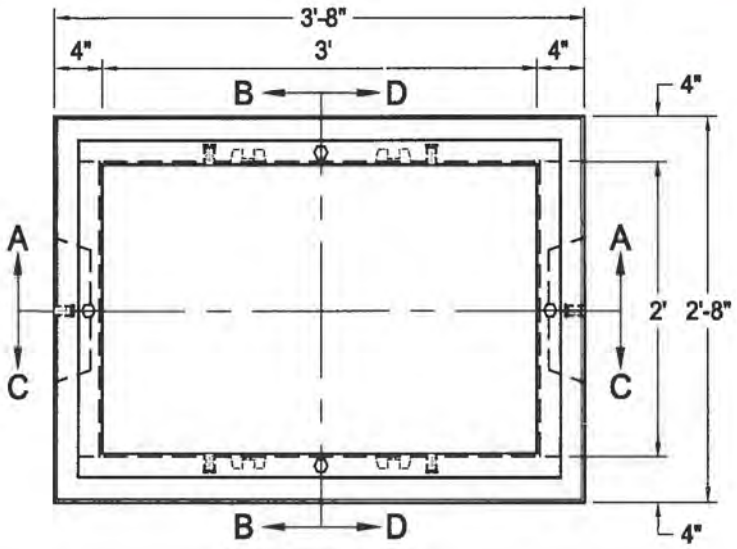
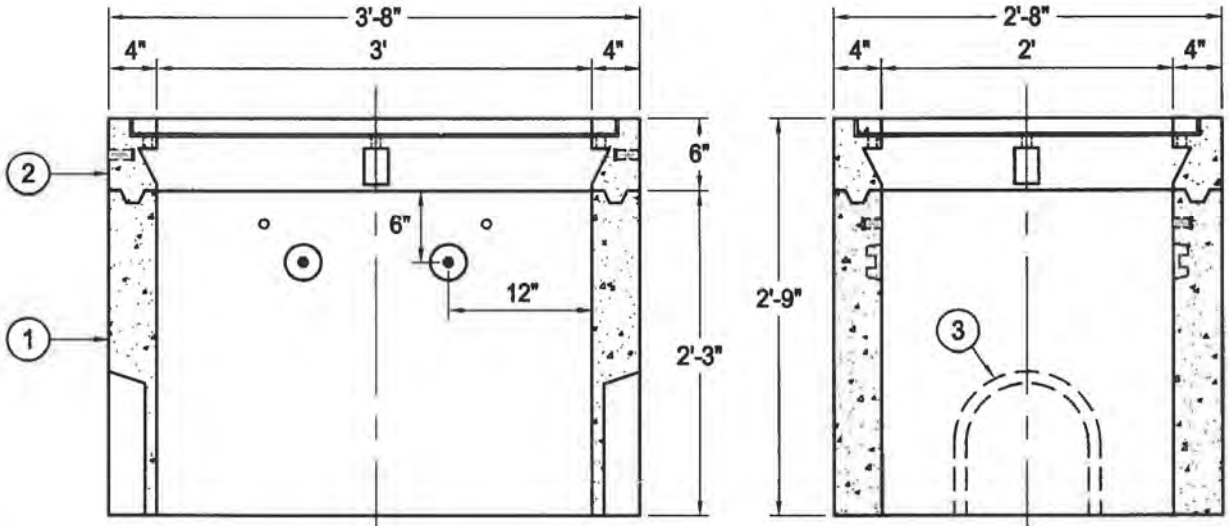
STANDARD DRAWING

**BH 717**

SHEET 1 OF 3




PLAN VIEW




SECTION A-A / C-C

SECTION B-B / D-D

# 2' x 3' WATER VAULT BOX & LID

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

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CIVIL ENGINEERING DIVISION

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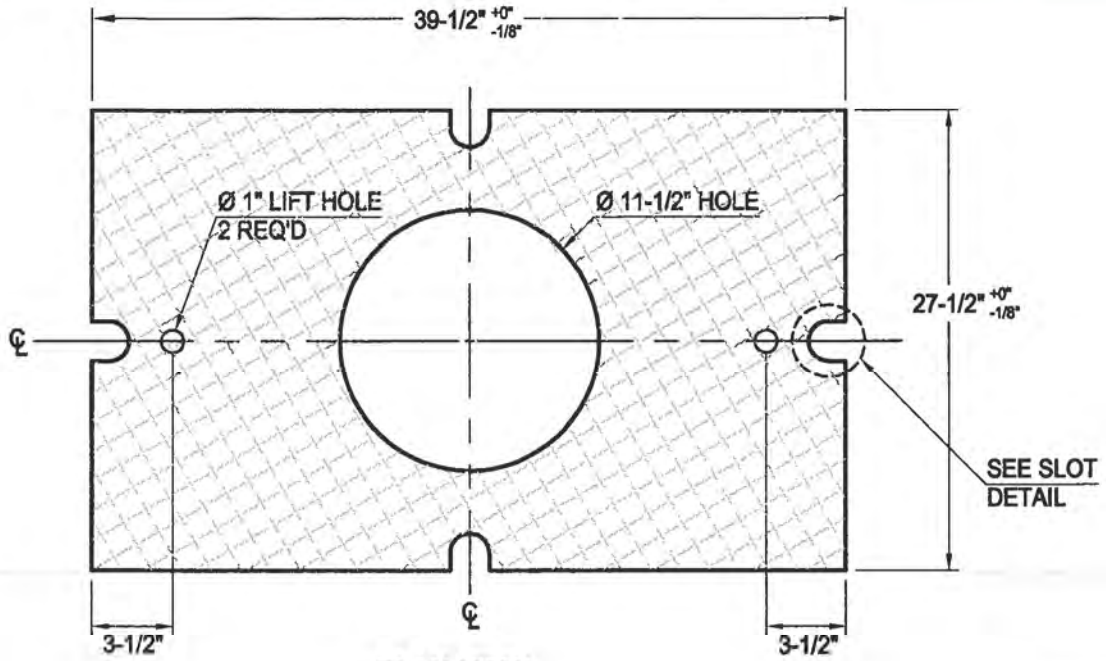
APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

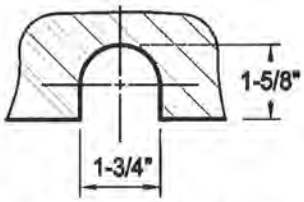
STANDARD DRAWING

**BH 717**

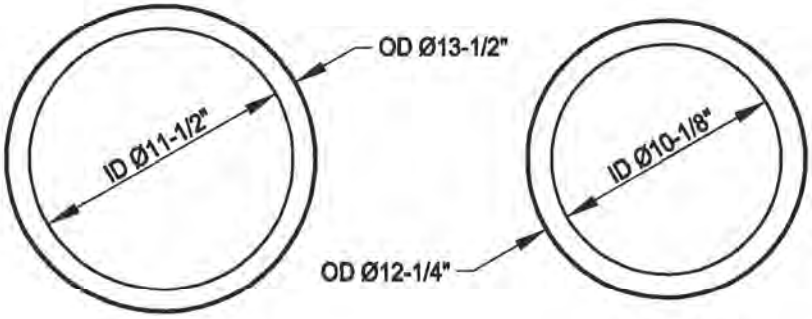
SHEET 2 OF 3




PLAN VIEW




SLOT DETAIL
4 PLACES




1/4" PLATE (1)

1/4" PLATE (1)

APPROX. 104 lbs.

| QTY. | MATERIALS |
|---|---|
| 1 | 5/16" DIAMOND PLATE 27-1/2" x 39-1/2" |
| 1 | 10-1/8" ID x 12-1/4" OD 1/4" PLATE |
| 1 | 11-1/2" ID x 13-1/2" OD 1/4" PLATE |

# 2' x 3' WATER VAULT BOX & LID

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

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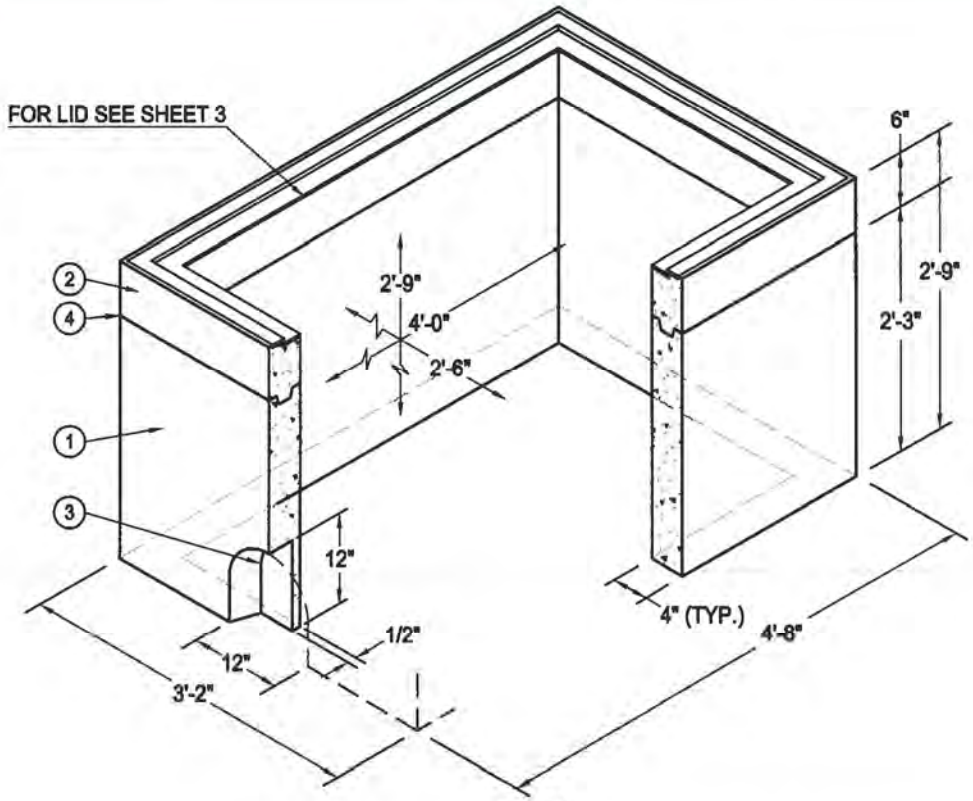
STANDARD DRAWING
**BH 717**
SHEET 3 OF 3




MATERIALS:

(1) 27" HIGH LOWER SECTION.

(2) 6" TOP SECTION WITH GALVANIZED CAST-IN FRAME.

(3) 12" x 12" KNOCK OUT x 3-1/2" DEEP ON EACH END WALL

(4) 6" OR 12" EXTENSION SECTIONS AVAILABLE.

NOTES:

1. DESIGNED FOR PEDESTRIAN/PARKWAY LOADS OR TRAFFIC AASHTO H20 FOR USE IN OFF-STREET LOCATIONS ONLY.

   STRUCTURE DESIGNED IN ACCORDANCE WITH:

   - AASHTO H-20 TRAFFIC BRIDGE LOADING
   - ASTM C-857 STANDARD PRACTICE FOR MINIMUM STRUCTURAL DESIGN LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES
   - AMERICAN CONCRETE INSTITUTE ACI 318-05

2. CONCRETE COMPRESSIVE STRENGTH F'c = 5500 PSI.
3. REINFORCEMENT IN ACCORDANCE WITH ASTM A-706 WITH A YIELD STRENGTH OF Fy = 60,000 PSI.
4. 6" MINIMUM COMPACTED GRANULAR MATERIAL RECOMMENDED FOR SUB-BASE FOR EASE OF INSTALLATION AND EVEN LOAD DISTRIBUTION.
5. MINIMUM EXCAVATION SIZE: 3'-8" x 5'-2" x REQUIRED DEPTH.

# 2'-6" x 4' WATER VAULT BOX & LID

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

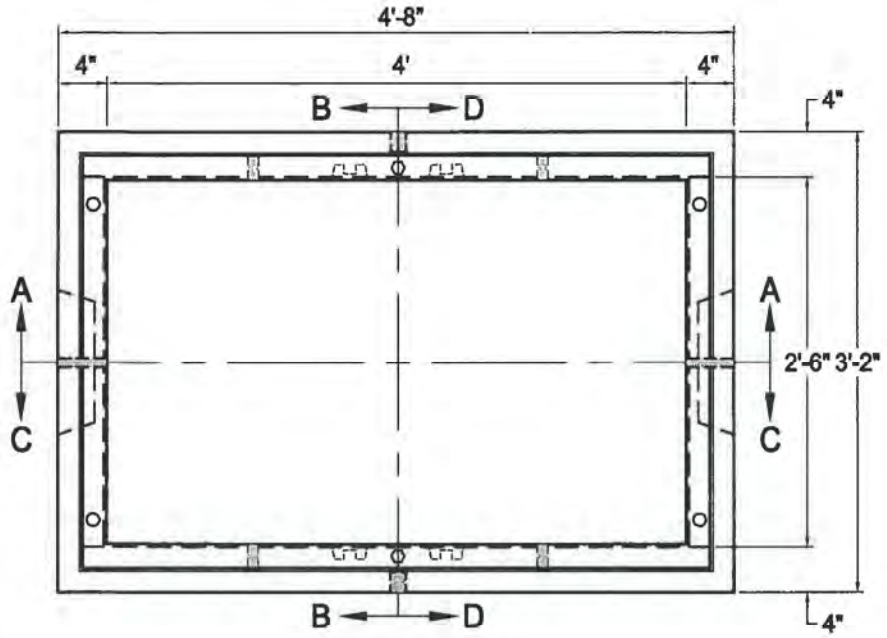
RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

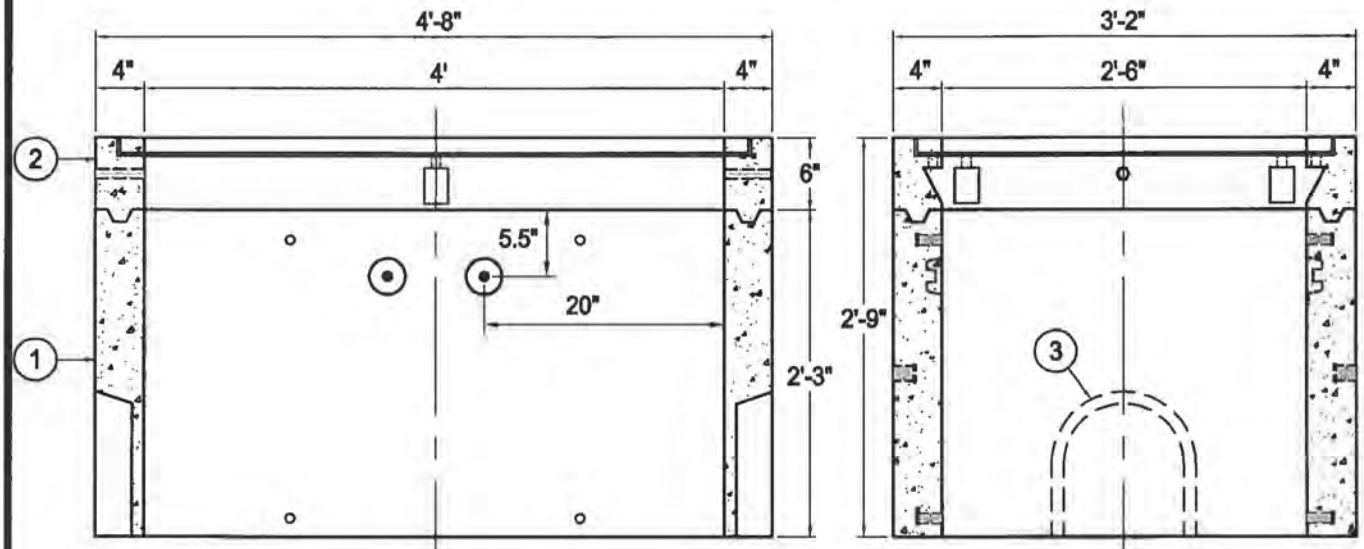
STANDARD DRAWING

**BH 718**

SHEET 1 OF 3




PLAN VIEW




SECTION A-A / C-C

SECTION B-B / D-D

# 2'-6" x 4' WATER VAULT BOX & LID

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

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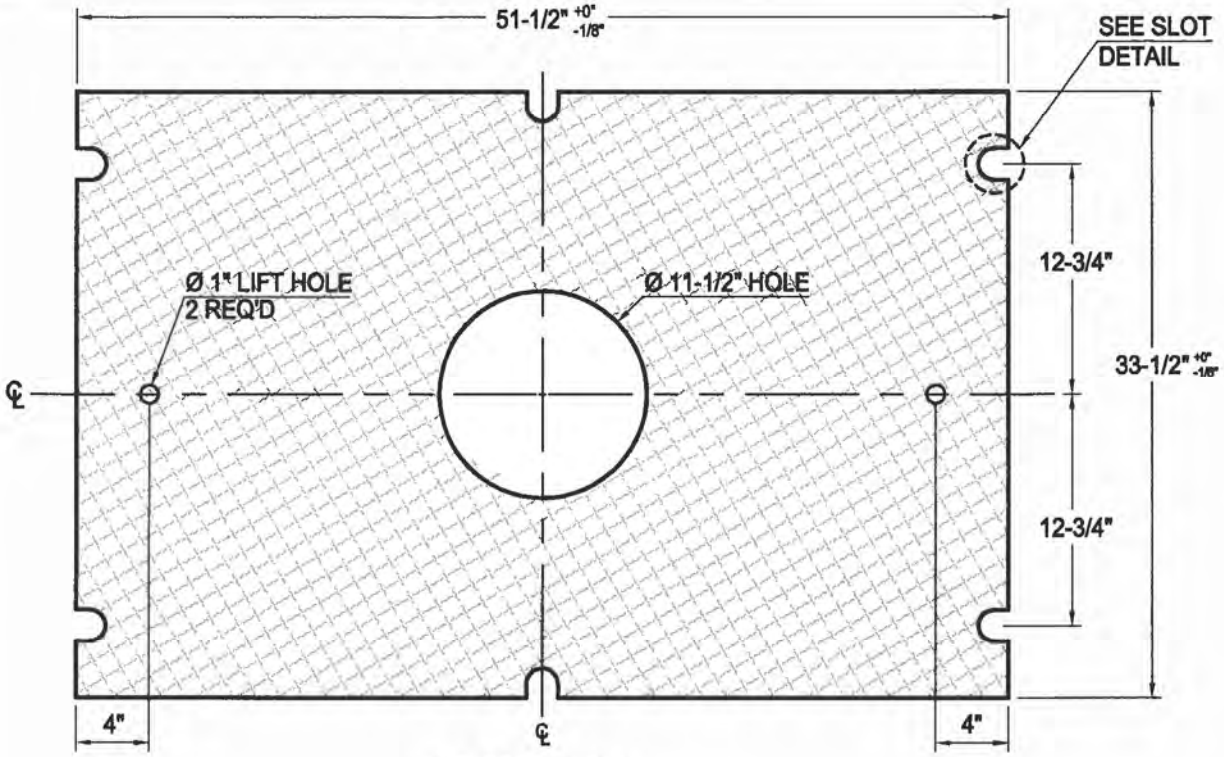
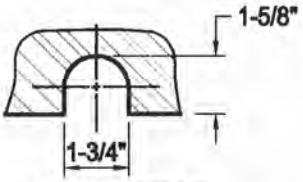
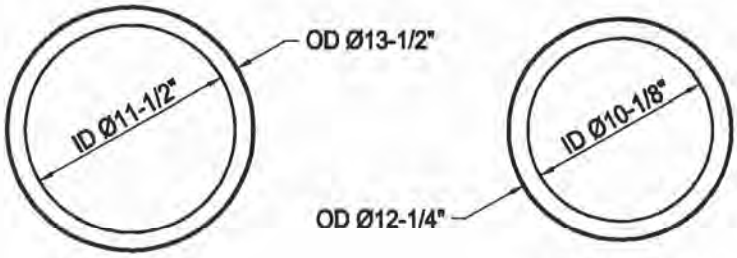
STANDARD DRAWING
**BH 718**
SHEET 2 OF 3




PLAN VIEW




SLOT DETAIL
6 PLACES




1/4" PLATE (1)

1/4" PLATE (1)

| QTY. | MATERIALS |
|---|---|
| 1 | 5/16" DIAMOND PLATE 33-1/2" x 51-1/2" |
| 1 | 10-1/8" ID x 12-1/4" OD 1/4" PLATE |
| 1 | 11-1/2" ID x 13-1/2" OD 1/4" PLATE |

# 2'-6" x 4' WATER VAULT BOX & LID

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
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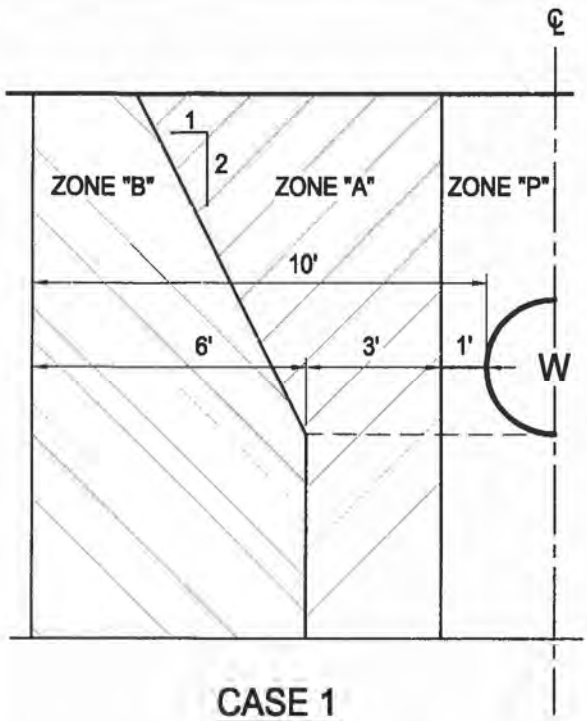
**CITY OF BEVERLY HILLS, CALIFORNIA**

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

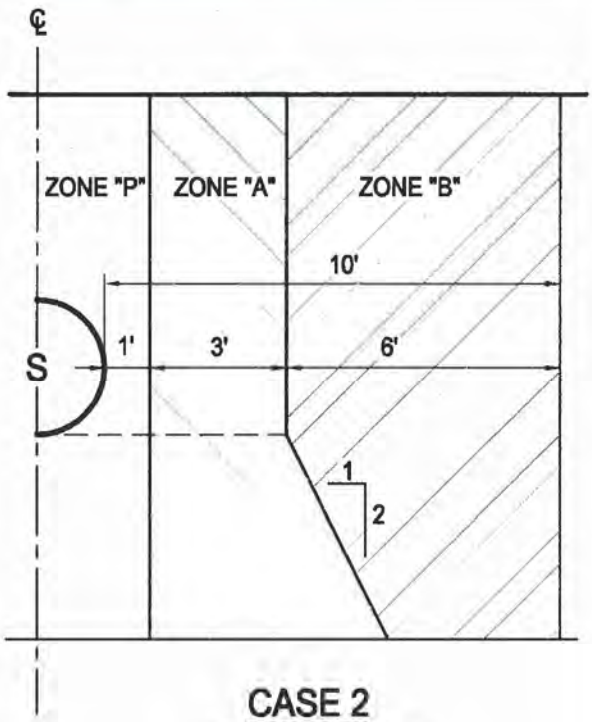
STANDARD DRAWING
**BH 718**
SHEET 3 OF 3




## CASE 1

NEW SEWER

| ZONE | SPECIAL CONSTRUCTION REQUIRED FOR SEWER |
|---|---|
| A. | SEWER LINES PARALLEL TO WATER MAINS SHALL NOT BE PERMITTED IN THIS ZONE WITHOUT APPROVAL FROM THE CITY OF BEVERLY HILLS. |
| B. | A SEWER LINE PLACED PARALLEL TO A WATER LINE SHALL BE CONSTRUCTED OF:<br>1. EXTRA STRENGTH VITRIFIED CLAY PIPE WITH COMPRESSION JOINTS.<br>2. PLASTIC SEWER PIPE WITH RUBBER RING JOINTS (PER ASTM D 3034) OR EQUIVALENT.<br>3. CAST OR DUCTILE IRON PIPE WITH COMPRESSION JOINTS.<br>4. REINFORCED CONCRETE PRESSURE PIPE WITH COMPRESSION JOINTS (PER AWWA C302-74). |
| P. | PROHIBITED ZONE - NO SEWER MAINS ARE ALLOWED TO BE INSTALLED IN THIS ZONE. |




## CASE 2

NEW WATER MAIN

| ZONE | SPECIAL CONSTRUCTION REQUIRED FOR SEWER |
|---|---|
| A. | NO WATER MAINS PARALLEL TO SEWERS SHALL BE CONSTRUCTED WITHOUT APPROVAL FROM THE CITY OF BEVERLY HILLS. |
| B. | A WATER LINE PLACED PARALLEL TO A SEWER LINE SHALL BE CONSTRUCTED OF STEEL PIPE, CML, AND CMC WITH WELDED JOINTS. |
| P. | PROHIBITED ZONE - NO WATER MAINS ARE ALLOWED TO BE INSTALLED IN THIS ZONE. |

ADDITIONAL NOTES:

1. ZONES IDENTICAL ON EITHER SIDE OF CENTER LINES,
2. WATER MAINS AND SEWER MAINS MUST NOT BE INSTALLED IN THE SAME TRENCH.
3. SEPARATION DISTANCES SPECIFIED SHALL BE MEASURED FROM THE NEAREST EDGE OF FACILITIES.
4. STEEL PIPE SHALL BE A MINIMUM OF 10 GAGE THICKNESS.

# SEWER AND WATER MAIN PARALLEL SEPARATION < 10'

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

CITY OF BEVERLY HILLS, CALIFORNIA

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

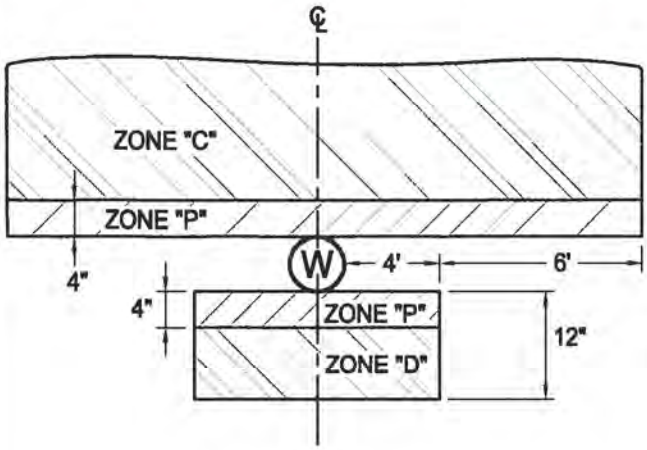
RECOMMENDED _____ CITY ENGINEER DATE 11-18-10

APPROVED _____ PUBLIC WORKS DIRECTOR DATE 11-18-10

STANDARD DRAWING

**BH 719**

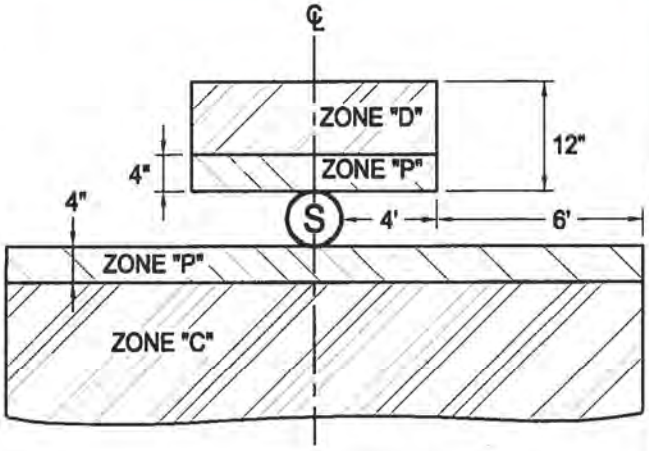
SHEET 1 OF 2




## CASE 1

NEW SEWER

| ZONE | SPECIAL CONSTRUCTION REQUIRED FOR SEWER |
|---|---|
| C. | A SEWER LINE CROSSING A WATER MAIN SHALL BE CONSTRUCTED OF:<br>1. DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING AND MECHANICAL JOINTS.<br>2. A CONTINUOUS SECTION OF CLASS 200 (DR 14 PER AWWA 0990) PLASTIC PIPE OR EQUIVALENT. CENTERED OVER THE PIPE BEING CROSSED.<br>3. A CONTINUOUS SECTION OF REINFORCED CONCRETE PRESSURE PIPE (PER AWWA C302-74) CENTERED OVER THE PIPE BEING CROSSED.<br>4. ANY SEWER PIPE WITHIN A CONTINUOUS SLEEVE. |
| D. | A SEWER LINE CROSSING A WATER MAIN SHALL BE CONSTRUCTED OF:<br>1. A CONTINUOUS SECTION OF DUCTILE IRON PIPE WITH HOT DIP BITUMINOUS COATING.<br>2. A CONTINUOUS SECTION OF CLASS 200 (DR 14 PER AWWA 0990) PLASTIC PIPE OR EQUIVALENT. CENTERED OVER THE PIPE BEING CROSSED.<br>3. A CONTINUOUS SECTION OF REINFORCED CONCRETE PRESSURE PIPE (PER AWWA C302-74) CENTERED OVER THE PIPE BEING CROSSED.<br>4. ANY SEWER PIPE WITHIN A CONTINUOUS SLEEVE<br>5. ANY SEWER PIPE SEPARATED BY A 10'x10'x4" THICK REINFORCED CONCRETE SLAB. |
| P. | PROHIBITED ZONE - NO SEWER MAINS ARE ALLOWED TO BE INSTALLED IN THIS ZONE. |




## CASE 2

NEW WATER MAIN

| ZONE | SPECIAL CONSTRUCTION REQUIRED FOR SEWER |
|---|---|
| C. | NO JOINTS WITHIN 10 FEET OF EITHER SIDE OF SEWER LINE. USE DUCTILE IRON PIPE, CML, AND POLYETHYLENE WRAPPED, OR STEEL PIPE, CML, AND CMC. |
| D. | NO JOINTS WITHIN 4 FEET OF EITHER SIDE OF SEWER LINE. USE DUCTILE IRON PIPE, CML, AND POLYETHYLENE WRAPPED, OR STEEL PIPE, CML, AND CMC. |
| P. | PROHIBITED ZONE - NO WATER MAINS ARE ALLOWED TO BE INSTALLED IN THIS ZONE. |

ADDITIONAL NOTES:

1. WATER MAINS AND SEWER MAINS MUST NOT BE INSTALLED IN THE SAME TRENCH.
2. SEPARATION DISTANCES SPECIFIED SHALL BE MEASURED FROM THE NEAREST EDGE OF FACILITIES.
3. STEEL PIPE SHALL BE A MINIMUM OF 10 GAGE THICKNESS.

# SEWER AND WATER MAIN PERPENDICULAR SEPARATION < 10'

| REVISIONS | | |
|---|---|---|
| MARK | DATE | DESCRIPTION |
| | | |
| | | |
| | | |

CITY OF BEVERLY HILLS, CALIFORNIA

DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
CIVIL ENGINEERING DIVISION

RECOMMENDED _____ DATE 11-18-10
CITY ENGINEER

APPROVED _____ DATE 11-18-10
PUBLIC WORKS DIRECTOR

STANDARD DRAWING

**BH 719**

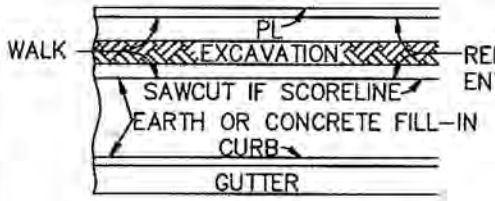
SHEET 2 OF 2

# APPENDIX B

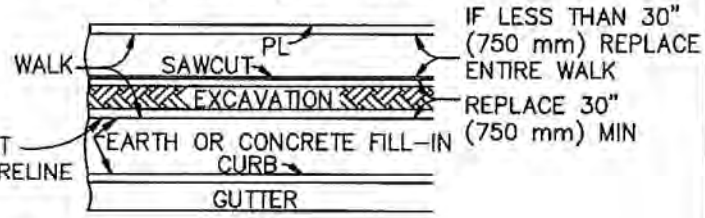
# WALK OR FILL–IN REPLACEMENT FOR EXCAVATIONS MADE PARALLEL TO CURB OR PROPERTY LINE

## WALK ADJACENT TO PROPERTY LINE

WALK LESS THAN 5' (1500 mm) WIDE

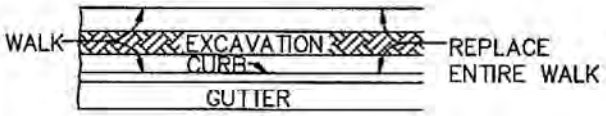



WALK 5' (1500 mm) WIDE OR MORE

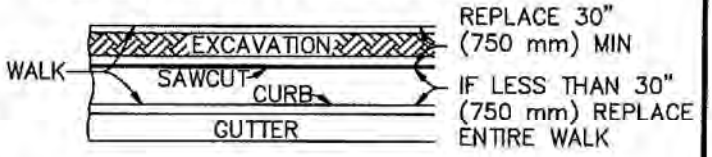



## WALK ADJACENT TO CURB

WALK LESS THAN 5' (1500 mm) WIDE

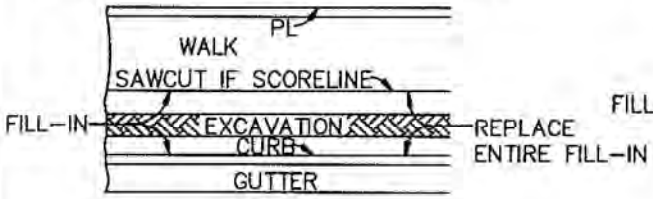



WALK 5' (1500 mm) WIDE OR MORE

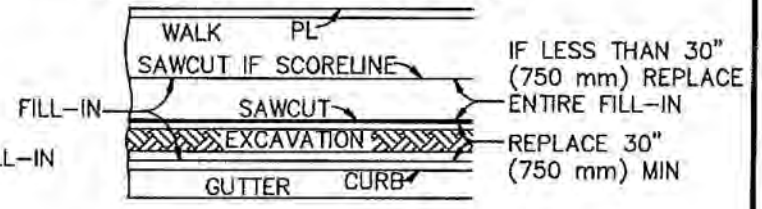



## FILL–IN REPLACEMENT

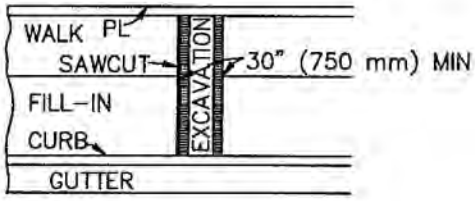
FILL–IN LESS THAN 5' (1500 mm) WIDE




FILL–IN 5' (1500 mm) WIDE OR MORE




# WALK OR FILL–IN REPLACEMENT FOR EXCAVATIONS MADE NORMAL TO CURB OR PROPERTY LINE




THESE REQUIREMENTS ALSO APPLY TO ENDS OF PARALLEL EXCAVATIONS.

IF AN EXCAVATION FALLS WITHIN 30" (750 mm) OF AN EXPANSION JOINT, CONSTRUCTION JOINT, WEAKENED PLANE JOINT, OR EDGE, THE CONCRETE SHALL BE REMOVED AND REPLACED TO THE JOINT OR EDGE.

IF AN EXCAVATION FALLS WITHIN 12" (300 mm) OF A SCORELINE, THE CONCRETE SHALL BE REMOVED AND REPLACED TO THE SCORELINE. THE SCORELINE SHALL BE SAWCUT BEFORE CONCRETE REMOVAL.

THE MINIMUM LENGTH OF REPLACEMENT IN BOTH CASES SHALL BE 30" (750 mm).

## NOTES

1. CONCRETE WALK, FILL-IN AND DRIVEWAYS REMOVED IN CONNECTION WITH CONSTRUCTION SHALL BE REPLACED TO NEATLY SAWED EDGES. ALL CUTS SHALL BE PARALLEL TO OR PERPENDICULAR TO THE CURB; ON CURVES, THE CUT SHALL BE RADIAL TO THE CURB.

2. DRIVEWAY APRONS IN WHICH THE "W" DISTANCE IS LESS THAN 11' (3300 mm) SHALL BE REPLACED IN THEIR ENTIRETY IF CUT IN ANY AREA.

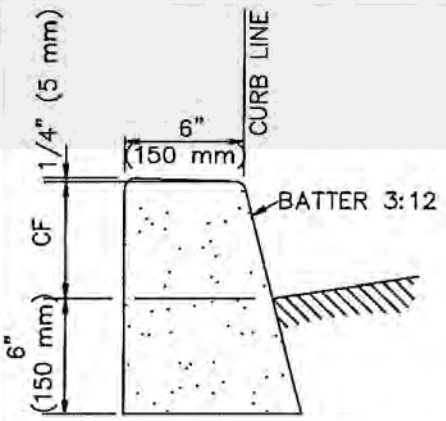
3. DRIVEWAY APRONS IN WHICH THE "W" DISTANCE IS 11' (3300 mm') OR MORE MAY BE CUT WITHIN THE "W" SECTION. THE MINIMUM REPLACEMENT SHALL BE 30" (750 mm) IN LENGTH. THE MINIMUM DISTANCE ALLOWED BETWEEN SUCH CUTS SHALL BE 14' (4200 mm').

4. DRIVEWAY APRONS IN WHICH THE "W" DISTANCE IS 11' (3300 mm) OR MORE MAY BE CUT IN THE "X" OR "R" SECTION. REPLACEMENT SHALL BE THE ENTIRE "X" OR "R" SECTION.

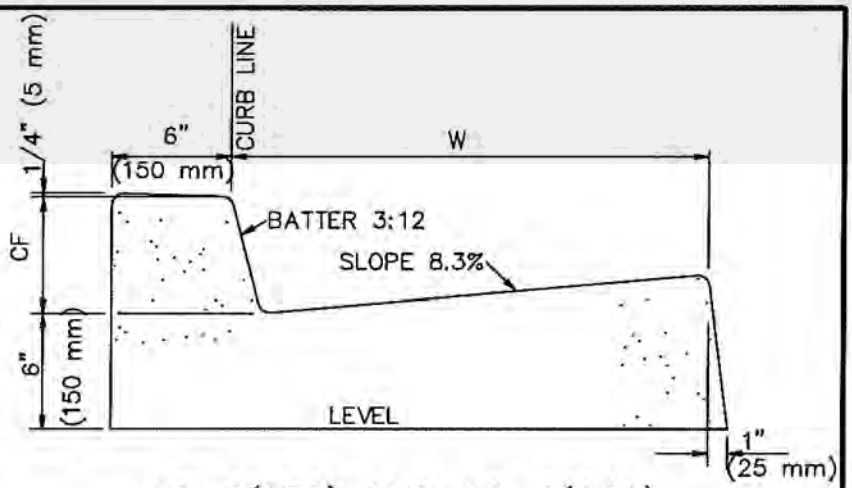
5. DRIVEWAY APRONS SHALL BE REPLACED FROM THE BACK OF THE CURB TO THE FRONT EDGE OF THE WALK, EXCEPT, WHERE WALK IS ADJACENT TO CURB, REPLACEMENT SHALL BE FROM BACK OF CURB TO BACK OF WALK.

6. WALK PORTIONS OF DRIVEWAYS SHALL BE REPLACED AS SHOWN ABOVE FOR EXCAVATIONS MADE PARALLEL OR NORMAL TO CURB.

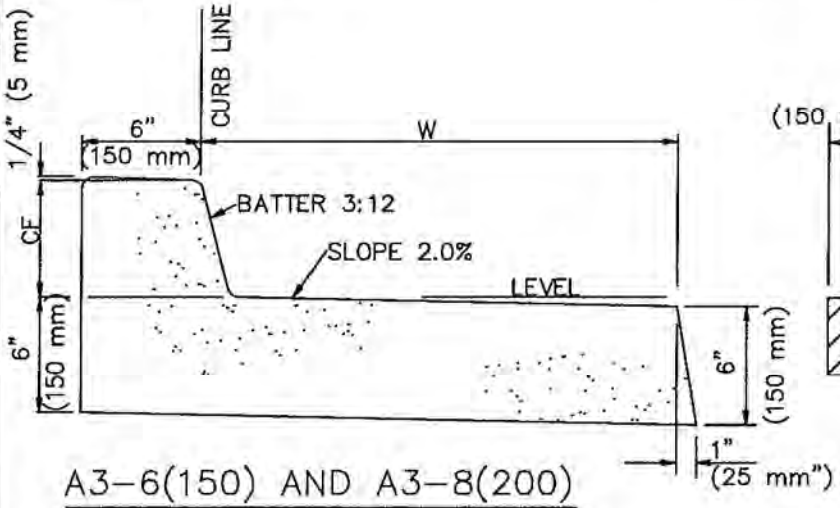
7. REPLACEMENT OF THE "X" OR "R" SECTION SHALL MATCH EXISTING CONSTRUCTION.



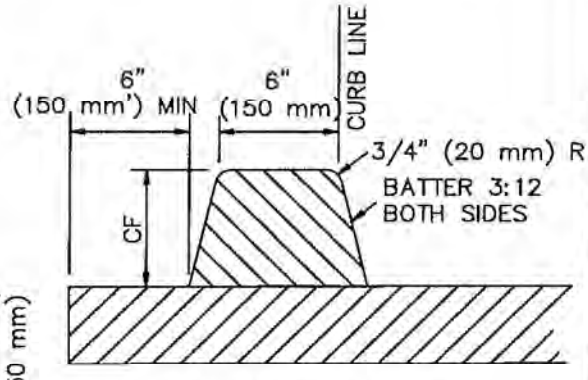

A1–6(150) AND
A1–8(200)




A2–6(150) AND A2–8(200)



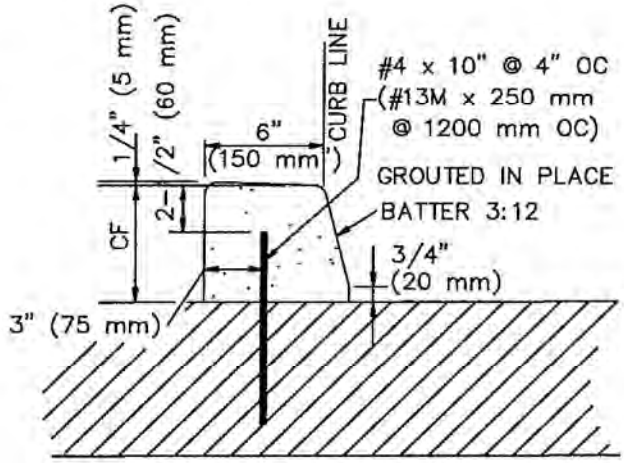

A3–6(150) AND A3–8(200)




D1–6(150) AND
D1–8(200)

NOTES:

1. THE LAST NUMBER IN THE DESIGNATION IS THE CURB FACE (CF) HEIGHT, INCHES (mm).
2. GUTTER WIDTH, W, IS 24" (600 mm) UNLESS OTHERWISE SPECIFIED.
3. TYPES A1, A2, A3 AND C1 SHALL BE CONSTRUCTED FROM PCC.
4. TYPE D1 CURB SHALL BE CONSTRUCTED FROM ASPHALT CONCRETE.
5. TYPE C1 CURB SHALL BE ANCHORED WITH STEEL DOWELS AS SHOWN OR WITH AN EPOXY APPROVED BY THE ENGINEER.
6. ALL EXPOSED CORNERS ON PCC CURBS AND GUTTERS SHALL BE ROUNDED WITH A 1/2" (15 mm) RADIUS.




C1–6(150) AND C1–8(200)

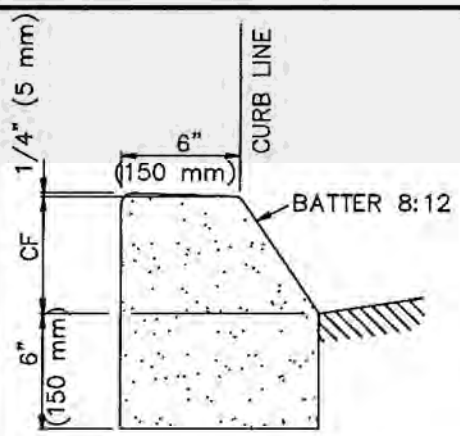
STANDARD PLAN FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 2009

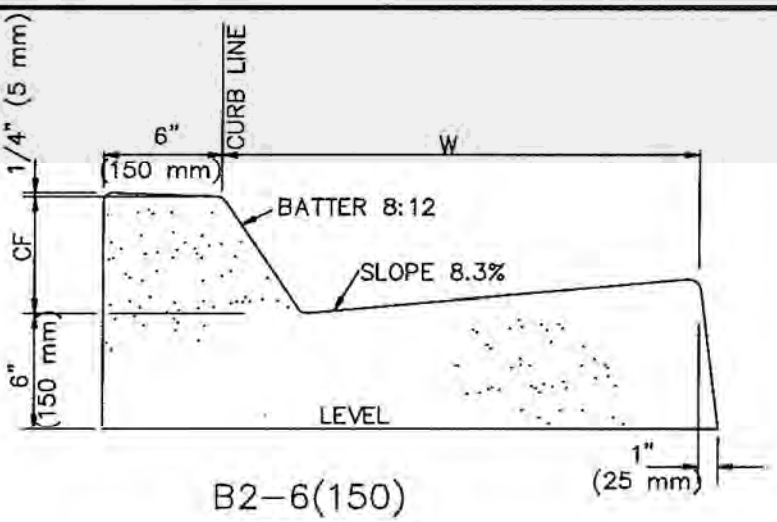
# CURB AND GUTTER – BARRIER

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

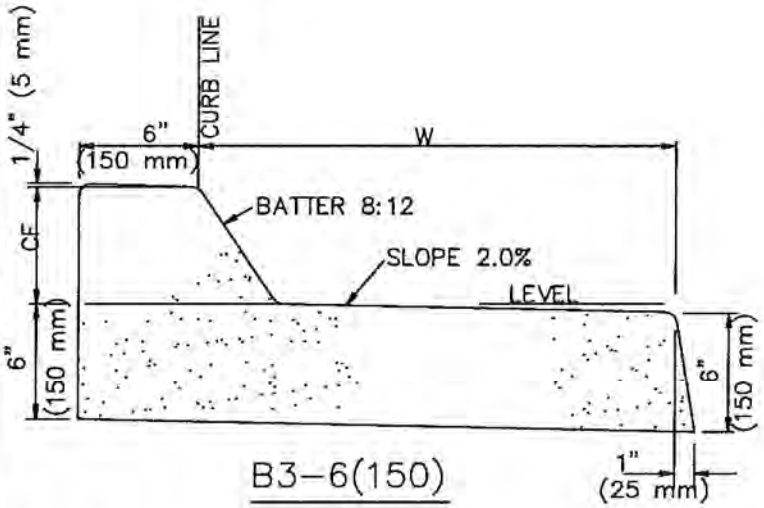
STANDARD PLAN
120–2
SHEET 1 OF 1



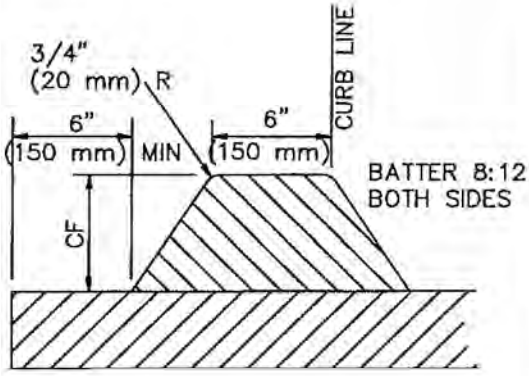

B1–6(150)




B2–6(150)



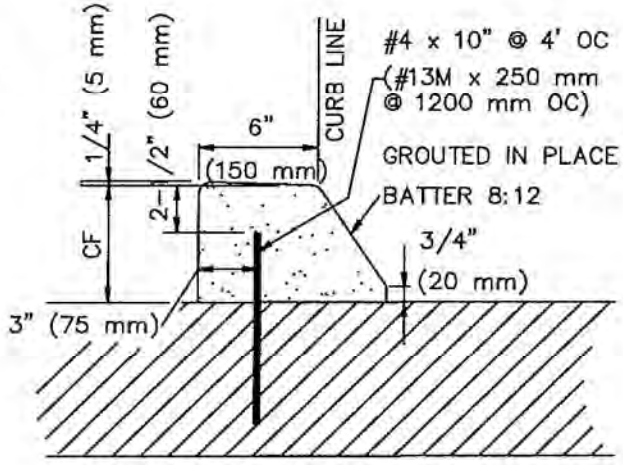

B3–6(150)




D2–6(150)

NOTES:

1. THE LAST NUMBER IN THE DESIGNATION IS THE CURB FACE (CF) HEIGHT, INCHES (mm).
2. GUTTER WIDTH, W, IS 24" (600 mm) UNLESS OTHERWISE SPECIFIED.
3. TYPES B1, B2, B3 AND C2 SHALL BE CONSTRUCTED FROM PCC.
4. TYPE D2 CURB SHALL BE CONSTRUCTED FROM ASPHALT CONCRETE.
5. TYPE C2 CURB SHALL BE ANCHORED WITH STEEL DOWELS AS SHOWN OR WITH AN EPOXY APPROVED BY THE ENGINEER.
6. ALL EXPOSED CORNERS ON PCC CURBS AND GUTTERS SHALL BE ROUNDED WITH A 1/2" (15 mm) RADIUS.




C2–6(150)

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

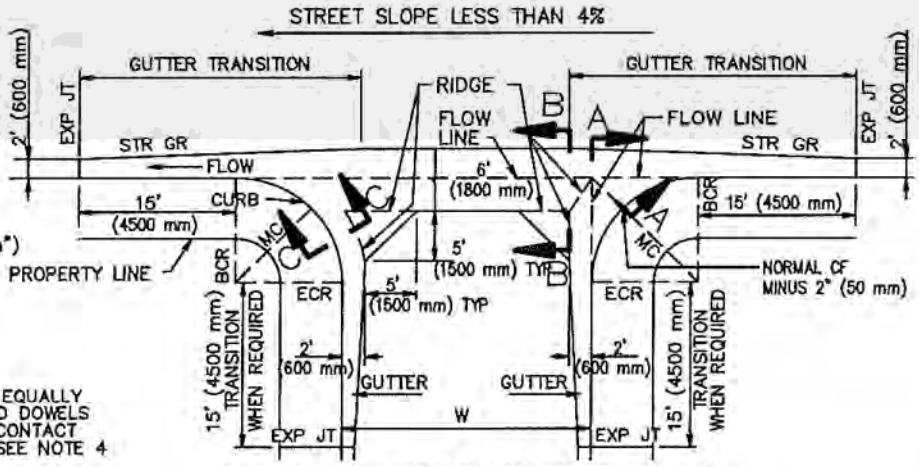
PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 2009

# CURB AND GUTTER–MOUNTABLE

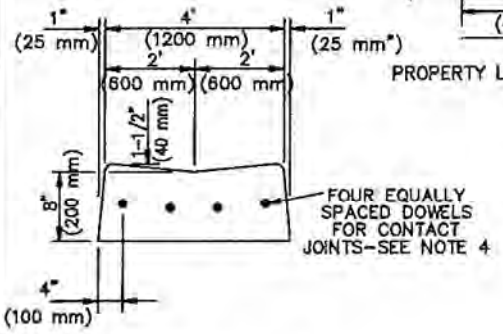
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 121–2

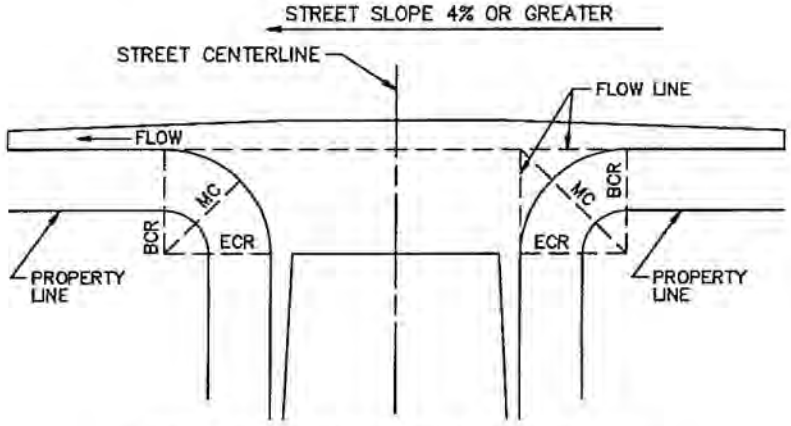
SHEET 1 OF 1



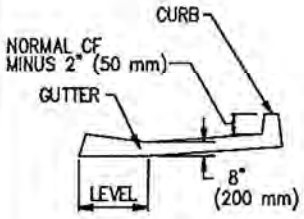

TYPICAL CROSS GUTTER PLAN
STREET SLOPE LESS THAN 4%



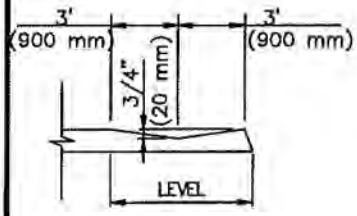

LONGITUDINAL
GUTTER



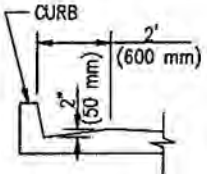

TYPICAL CROSS GUTTER PLAN
STREET SLOPE MORE THAN 4%



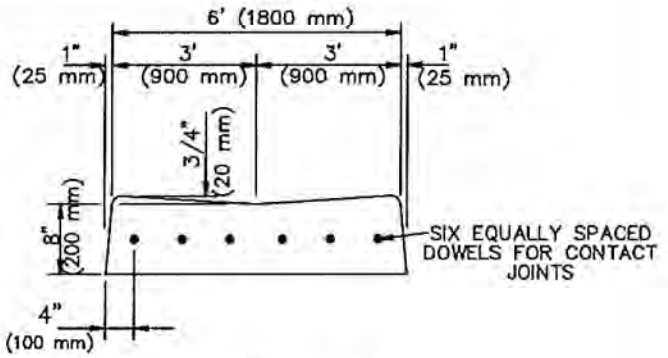

SECTION A–A




SECTION B–B




SECTION C–C




SECTION D–D

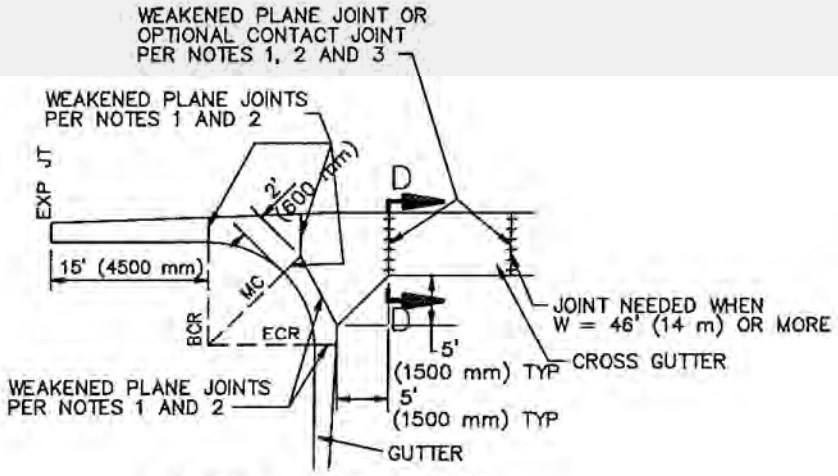
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 2009

# CROSS AND LONGITUDINAL GUTTERS

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

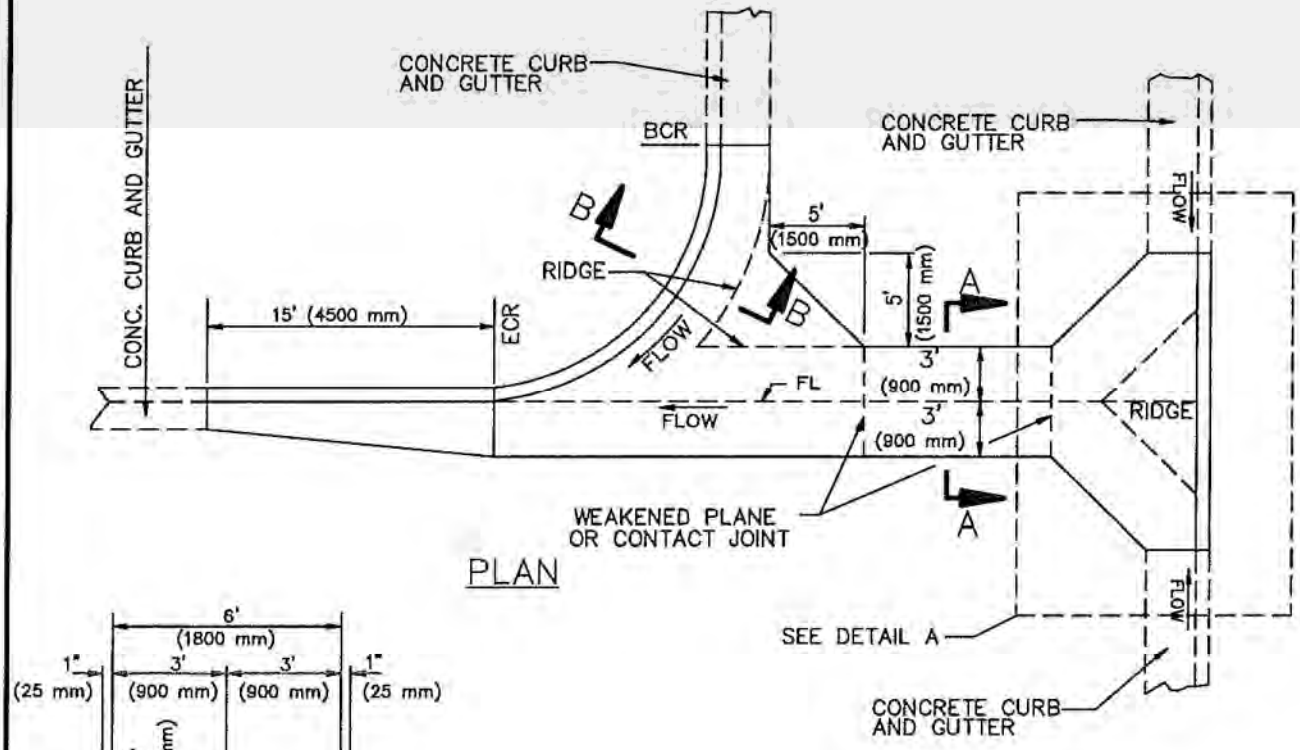
STANDARD PLAN
122–2
SHEET 1 OF 2



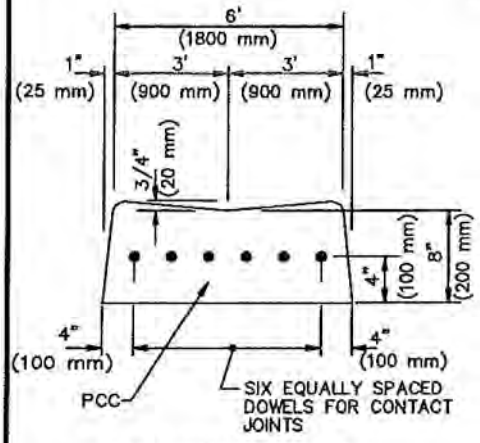

TYPICAL JOINT PLAN

NOTES:

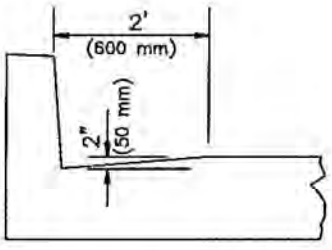
1. WEAKENED PLANE AND/OR CONTACT JOINTS SHALL BE PLACED IN CURB AND GUTTER AT LOCATIONS SHOWN ON THE TYPICAL JOINT PLAN HEREON.
2. WEAKENED PLANE JOINTS SHALL BE PLASTIC CONTROL JOINTS OR 1–1/2" (40 mm) DEEP SAW CUTS. CONCRETE SAWING SHALL TAKE PLACE WITHIN 24 HOURS AFTER CONCRETE IS PLACED.
3. DOWELS FOR CONTACT JOINTS SHALL BE #4 BARS 18" LONG (#13M BARS 450 mm LONG).
4. PLACE A WEAKENED PLANE OR CONTACT JOINT WHERE LONGITUDINAL ALLEY GUTTER JOINS CONCRETE ALLEY INTERSECTION.
5. ALL EXPOSED CORNERS ON PCC GUTTERS SHALL BE ROUNDED WITH 1/2" (15 mm) RADIUS.
6. CONCRETE SHALL BE INTEGRAL WITH CURB UNLESS OTHERWISE SPECIFIED.



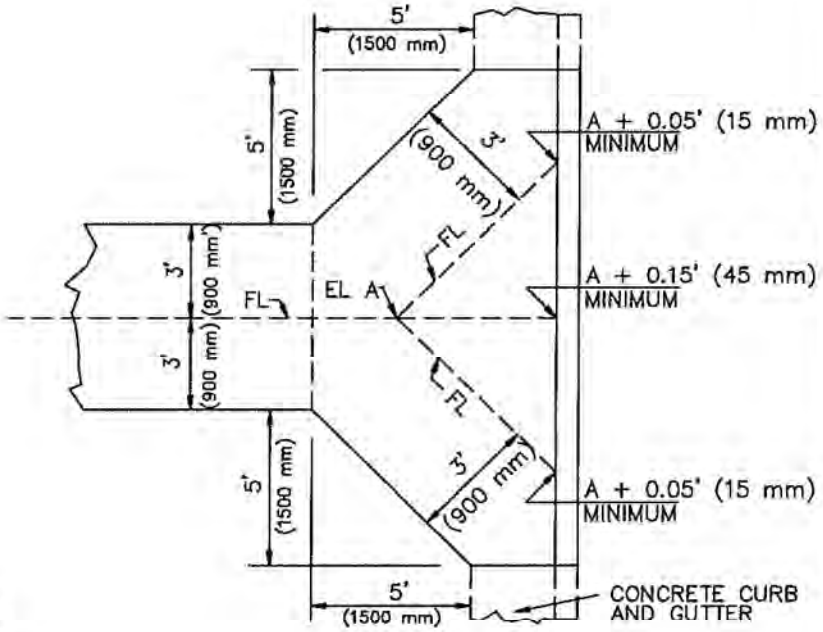

PLAN




SECTION A–A




SECTION B–B




DETAIL A

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1993 REV. 1996, 2009

# CROSS GUTTER AT T INTERSECTIONS

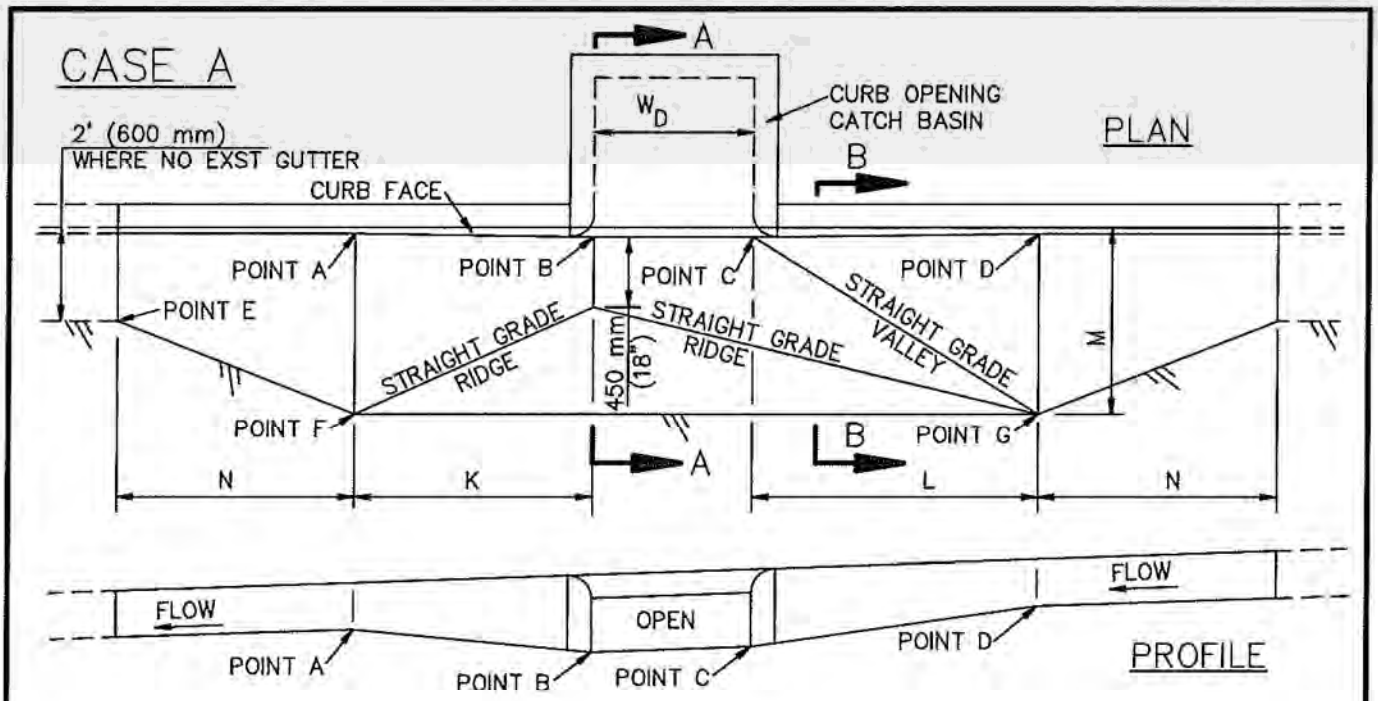
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

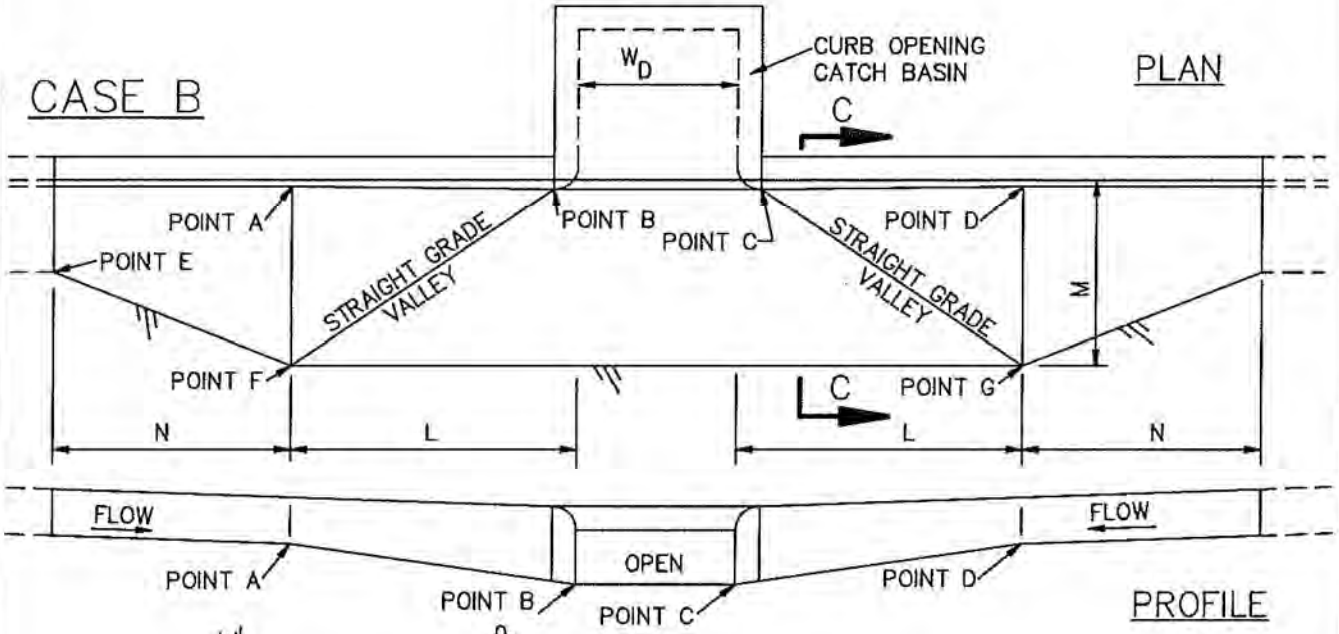
STANDARD PLAN 123–2

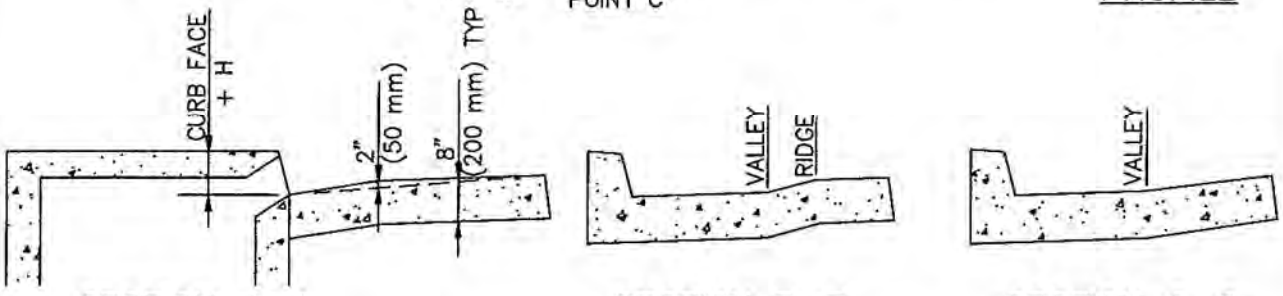
SHEET 1 OF 2

NOTES:

1. WEAKENED PLANE JOINTS SHALL BE PLASTIC CONTROL JOINTS OR 1–1/2" (35 mm) DEEP SAW CUTS. CONCRETE SAWING SHALL TAKE PLACE WITHIN 24 HOURS AFTER CONCRETE IS PLACED.
2. DOWELS FOR CONTACT JOINTS SHALL BE #4 BARS 18" LONG (#13M BARS 450 mm LONG).
3. ALL EXPOSED CORNERS SHALL BE ROUNDED WITH 1/2" (15 mm) RADIUS.
4. CONCRETE SHALL BE INTEGRAL WITH CURB UNLESS OTHERWISE SPECIFIED.




STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984 REV. 1996, 2005, 2009

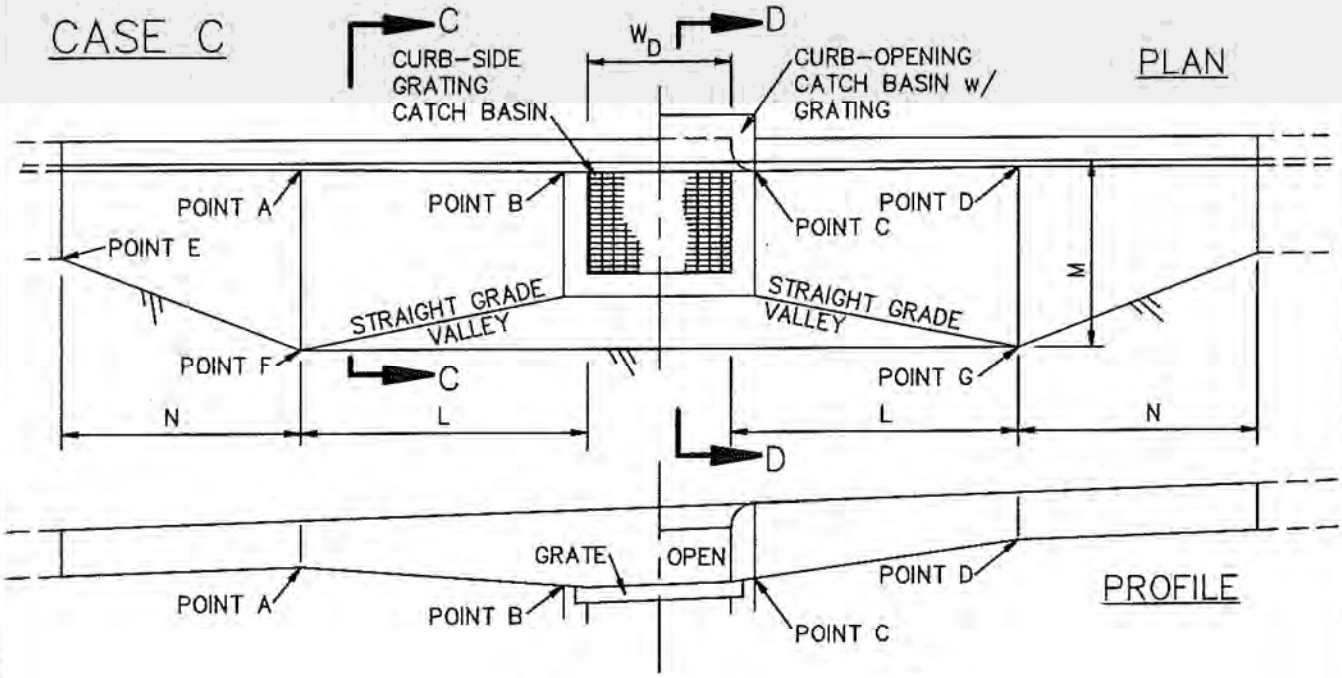
# LOCAL DEPRESSIONS AT CATCH BASINS

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

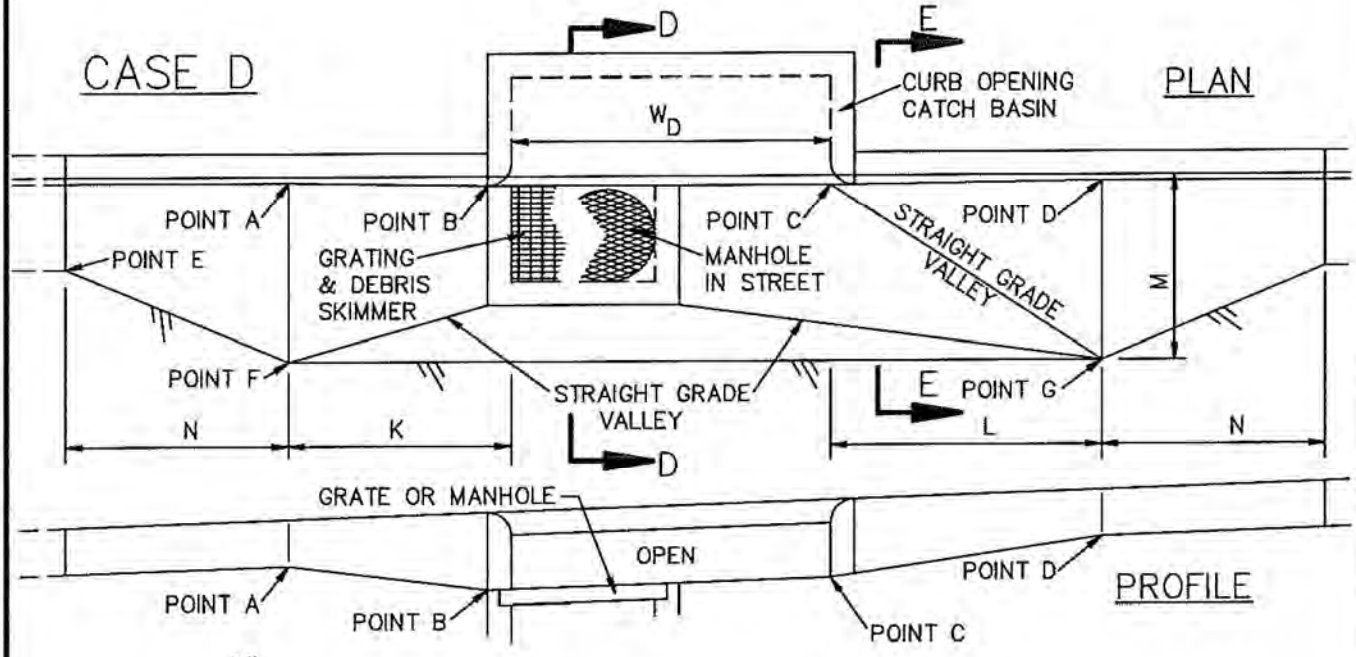
STANDARD PLAN 313–3

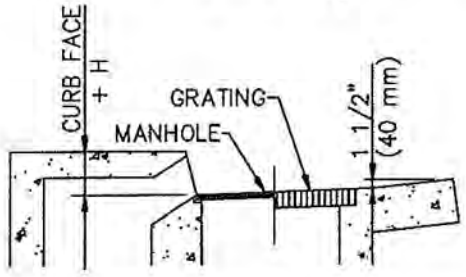
SHEET 1 OF 4

## CASE C

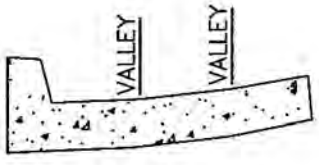



## CASE D




SECTION D–D



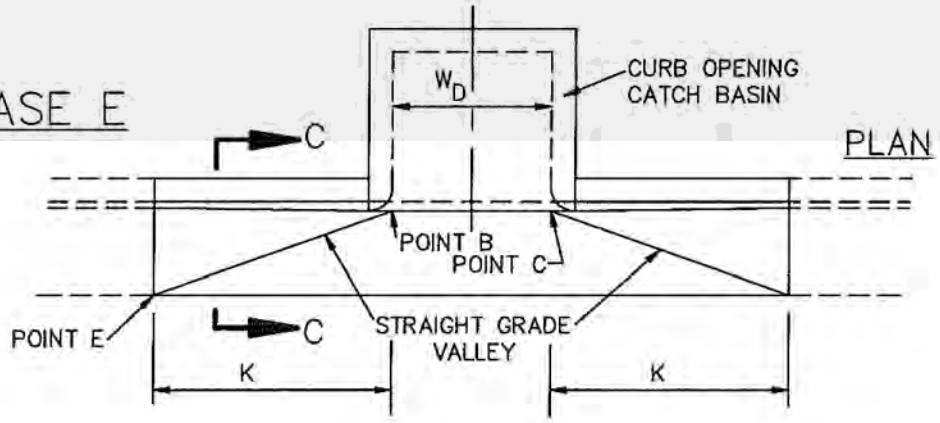

SECTION E–E

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

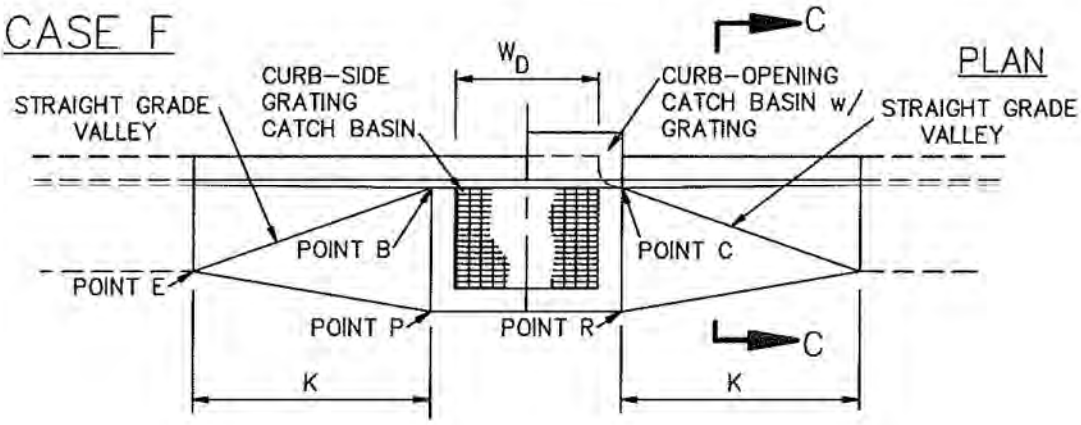
# LOCAL DEPRESSIONS AT CATCH BASINS

STANDARD PLAN
313–3
SHEET 2 OF 4

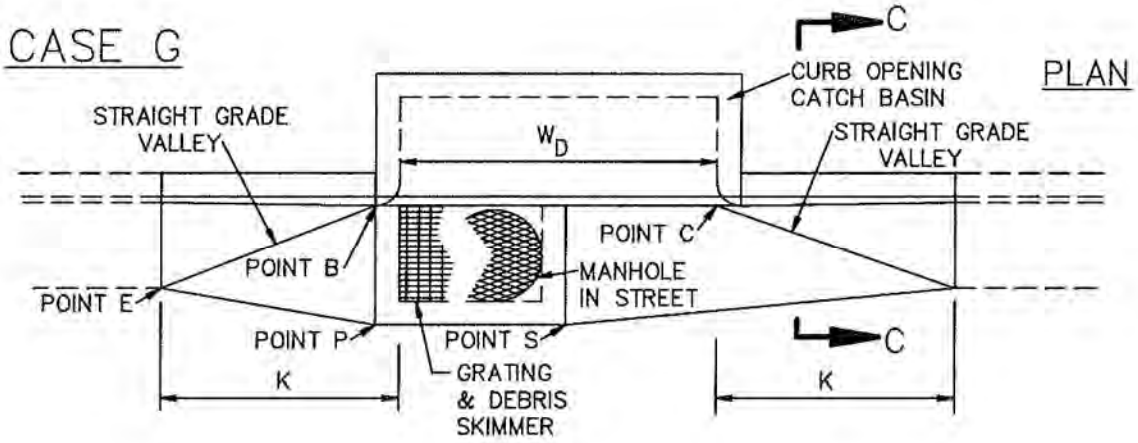
## CASE E

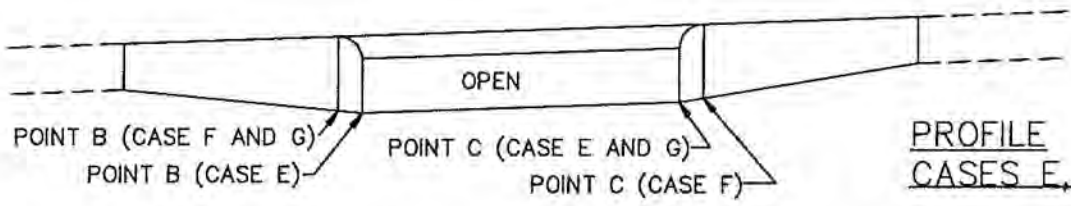



## CASE F




## CASE G




PROFILE
CASES E, F, G

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

# LOCAL DEPRESSIONS AT CATCH BASINS

STANDARD PLAN
313-3
SHEET 3 OF 4

NOTES:

1. ALL EXPOSED EDGES SHALL BE ROUNDED TO A 1/2" (15 mm) RADIUS.

2. THE CURB FACE AT POINTS A AND D SHALL BE THE NORMAL CURB FACE OF THE ADJACENT CURB. AT POINTS B AND C, THE CURB FACE SHALL BE THE NORMAL CURB FACE OF THE ADJACENT CURB PLUS H. (SEE APPLICABLE CATCH BASIN STANDARD PLAN.)

3. IN EXISTING STREETS WHERE NO PAVEMENT RECONSTRUCTION IS SPECIFIED ON THE PLANS, THE ELEVATION OF THE OUTER EDGE OF THE LOCAL DEPRESSION SHALL MEET THE FINISHED STREET SURFACE.

4. IN NEW STREETS OR IN EXISTING STREETS WHERE PAVEMENT RECONSTRUCTION IS SPECIFIED ON THE PLANS:

   THE ELEVATIONS OF POINTS F AND G SHALL BE SET H1 HIGHER THAN THE GUTTER FLOW LINE ELEVATIONS AT POINTS A AND D, RESPECTIVELY.

   THE ELEVATIONS OF POINTS P AND R SHALL BE SET H2 HIGHER THAN THE GUTTER FLOW LINE ELEVATIONS AT POINTS B AND C, RESPECTIVELY.

   THE ELEVATION OF POINT S SHALL BE SET H2 HIGHER THAN THE ELEVATION AT THE NEAREST GUTTER FLOW LINE.

   WHERE THERE IS NO GUTTER ADJACENT TO THE LOCAL DEPRESSION, THE ELEVATION OF POINT E SHALL BE SET H3 HIGHER THAN THE ELEVATION AT THE NEAREST TOE OF CURB.

5. DIMENSIONS:

   H, H1, H2 AND H3 SHALL BE AS NOTED ON THE PLANS.

   G = 24" (600 mm)

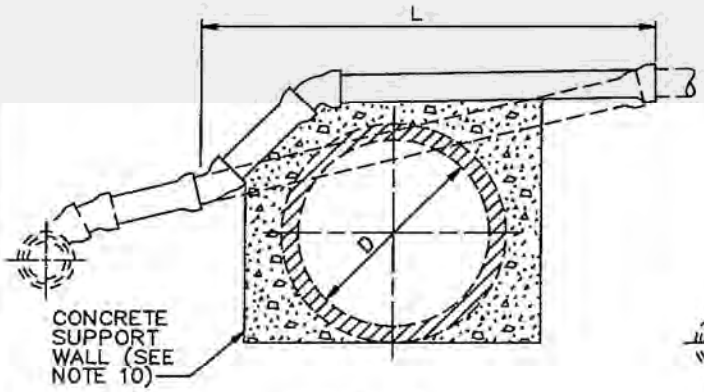
   K = 5'–0" (1500 mm)

   L = 6'–0" (1800 mm)

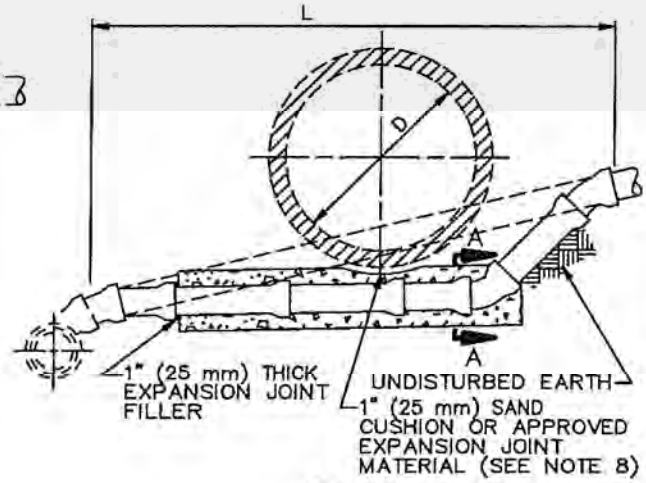
   M = 4'–0" (1200 mm)

   N = 5'–0" (1500 mm)

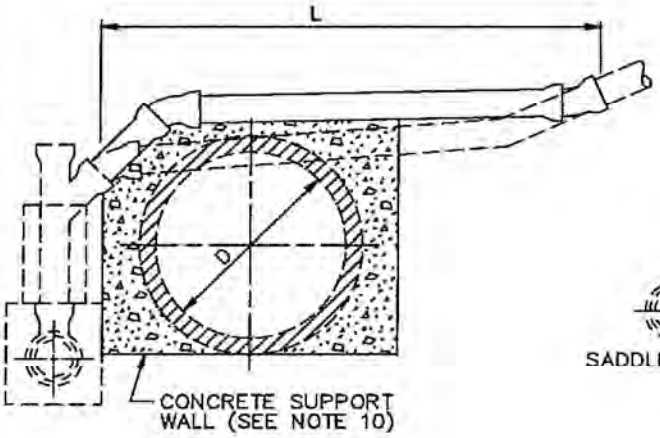
   $W_D$ = CATCH BASIN W FOR SINGLE CATCH BASIN OR DISTANCE BETWEEN EXTREME END WALLS FOR MULTIPLE CATCH BASINS.



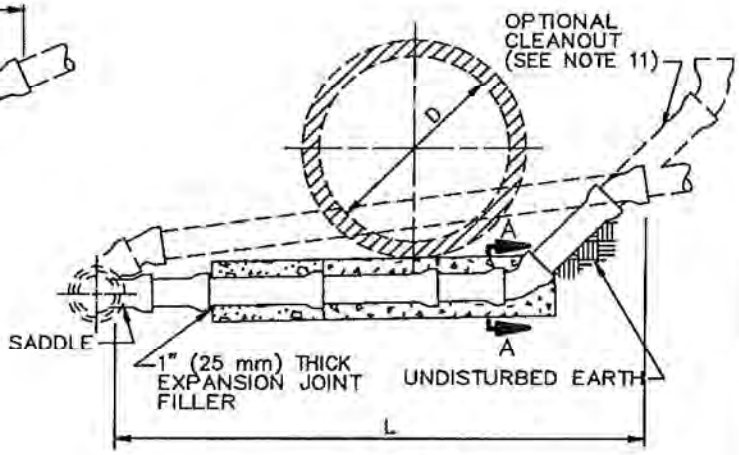

CASE A



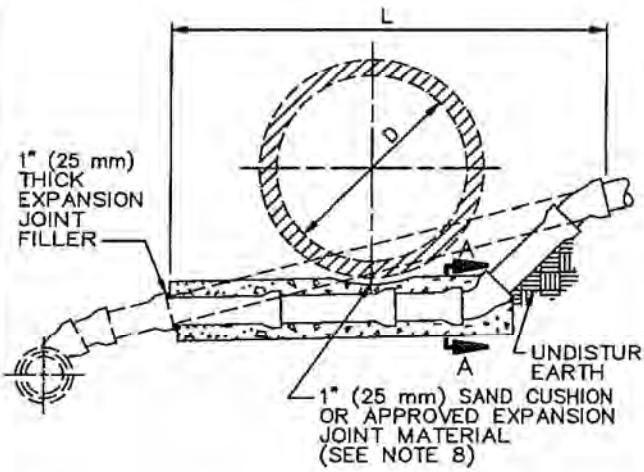

CASE D



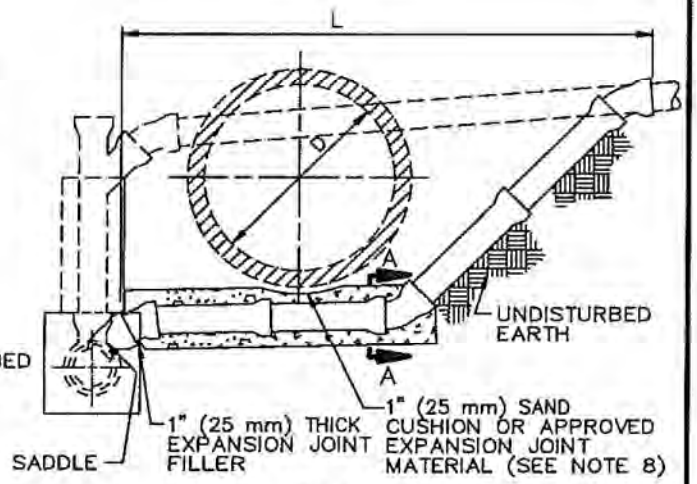

CASE B




CASE E




CASE C




CASE F

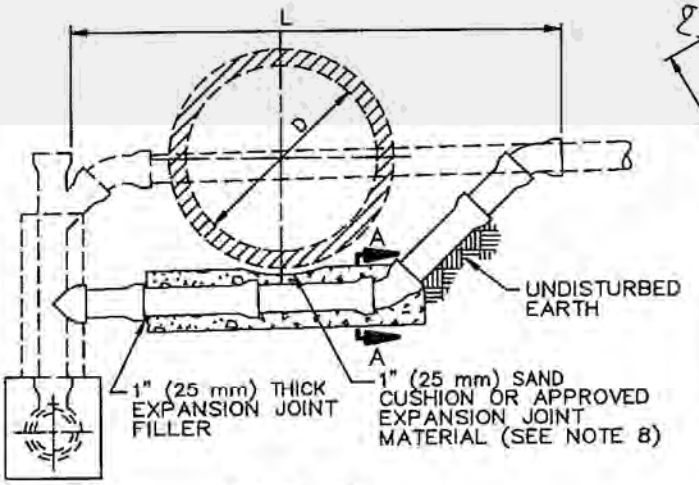
STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARD, INC. GREENBOOK COMMITTEE 1984 REV. 1996, 2009

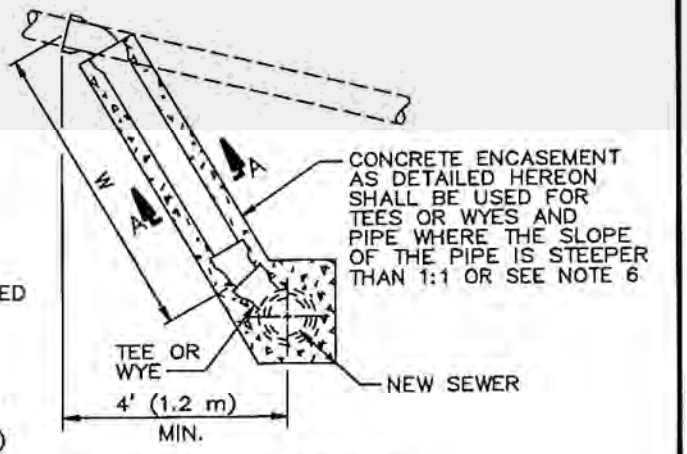
# HOUSE CONNECTION REMODELING

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

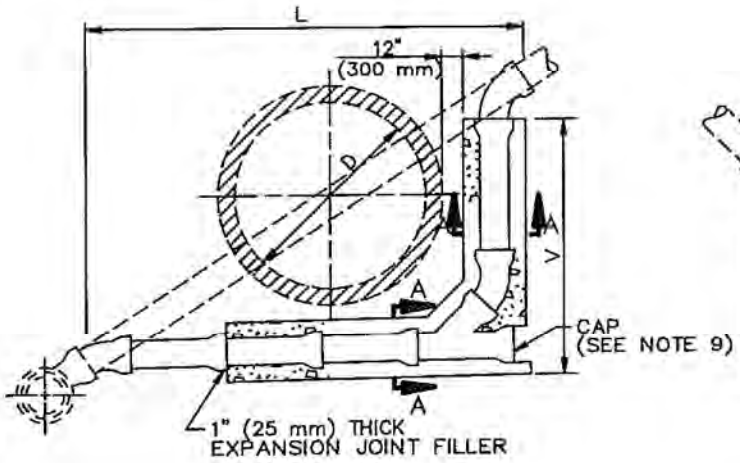
STANDARD PLAN 223-2



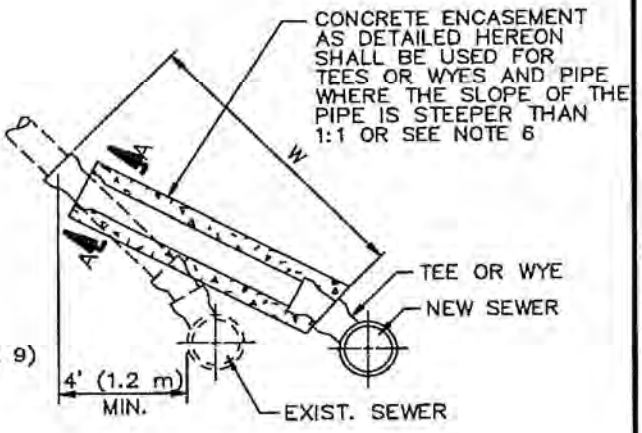

CASE G



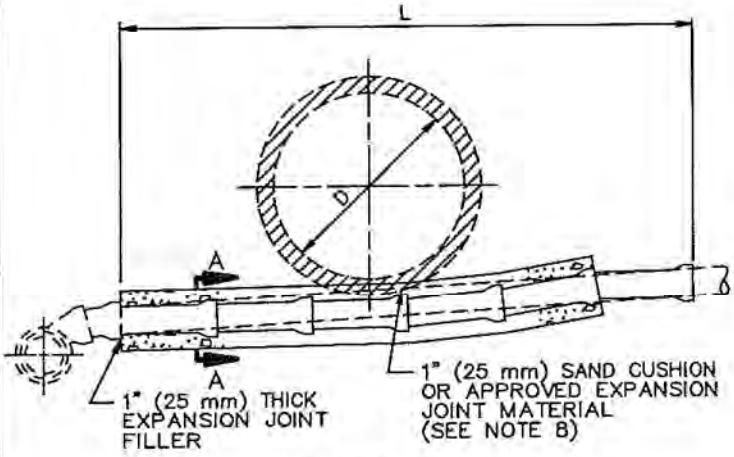

CASE R



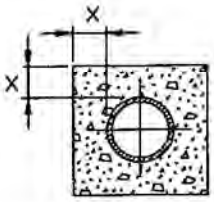

CASE H




CASE S




CASE K




| NOMINAL DIAMETER OF PIPE INCHES (mm) | MINIMUM DIMENSIONS X INCHES (mm) |
|---|---|
| 6 (150) | 3 (75) |
| 8 (200) | 4 (100) |
| 10 (250) | 5 (125) |
| 12 (300) | 6 (150) |

SECTION A–A
CONCRETE ENCASEMENT DETAIL
(SEE NOTE 5)

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

# HOUSE CONNECTION REMODELING

STANDARD PLAN
223–2
SHEET 2 OF 3

NOTES

1. EXCEPT AS OTHERWISE INDICATED HEREON OR ON THE PLANS, ALL HOUSE CONNECTION REMODELING SHALL CONFORM TO THE APPLICABLE PORTIONS OF SPPWC 222, HOUSE CONNECTION SEWER.

2. SEE PROJECT PLANS FOR VALUES OF D, L, V, AND W. (DIMENSION L IS THE HORIZONTAL LENGTH OF THE HOUSE CONNECTION REMODELING).

3. EXISTING SEWERS ARE INDICATED BY DASHED LINES. HOUSE CONNECTION SEWERS TO BE CONSTRUCTED ARE INDICATED BY SOLID LINES AND SHALL BE OF THE SAME MATERIAL AS THE EXISTING SEWER. THE CONTRACTOR MAY CONSTRUCT THE SEWER WITH OTHER MATERIALS ALLOWED BY SPPWC 222 PROVIDED APPROVED ADAPTORS ARE UTILIZED.

4. 1/16 (22.5°) OR 1/8 (45°) BENDS SHALL BE USED TO REMODEL OR CONSTRUCT ANY SEWER ON A CURVE OR AT ANY CHANGE IN ALIGNMENT. WHERE PHYSICAL OR GEOMETRIC LIMITATIONS PRECLUDE THE USE OF 1/16 (22.5°) OR 1/8 (45°) BENDS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL THE PROPOSED METHOD OF REMODELING OR CONSTRUCTION.

5. ALL HOUSE CONNECTION SEWERS TO BE CONSTRUCTED UNDER A PROPOSED CONDUIT SHALL BE ENCASED IN CONCRETE AS SHOWN HEREON. WHEN THE HOUSE CONNECTION SEWER SLOPE EXCEEDS 1:1 THE CONTRACTOR MAY, AT ITS OPTION, PLACE A CIRCULAR CROSS SECTION WITH MINIMUM COVER EQUAL TO DIMENSION "X" AS SHOWN ON SECTION A–A HEREON IN LIEU OF A SQUARE CROSS SECTION OF CONCRETE. CONCRETE BEDDING AND ENCASEMENT SHALL BE CLASS 450–C–2000 (250–C–14) AND SHALL EXTEND TO THE FIRST PIPE JOINT AT LEAST 1' (300 mm) BEYOND THE OD OF EACH SIDE OF THE PROPOSED CONDUIT.

6. FOR CASE R AND S, WHEN THE SLOPE OF THE PIPE EXCEEDS 1:1, THE CONTRACTOR MAY, AT ITS OPTION, CONSTRUCT A CHIMNEY CONFORMING TO SPPWC 220 ON THE NEW SEWER IN LIEU OF CONSTRUCTING THE ENCASEMENT SHOWN HEREON.

7. FOR CASES E AND F, SADDLES SHALL BE CONNECTED EITHER TO THE LENGTH OF PIPE CONTAINING THE EXISTING TEE OR WYE OR TO THE ADJACENT DOWNSTREAM PIPE LENGTH.

8. CONDUITS TO BE INSTALLED OVER OR WITHIN 1" (25 mm) OF ANY CONCRETE ENCASEMENT OR STRUCTURE, WHETHER EXISTING OR TO BE PLACED IN CONFORMITY WITH THE REQUIREMENTS HEREIN, SHALL BE INSTALLED ON A 1" (25 mm) SAND CUSHION OR APPROVED EXPANSION JOINT MATERIAL. CONCRETE ENCASEMENT INSTALLED PURSUANT TO THIS STANDARD PLAN SHALL BE SEPARATED FROM EXISTING CONDUIT WITH 1" (25 mm) THICK EXPANSION JOINT MATERIAL.

9. THOSE PORTIONS OF AN ABANDONED PIPE LOCATED BENEATH OR WITHIN 6" (150 mm) OF A RELOCATED HOUSE CONNECTION SEWER SHALL BE REMOVED. THE EXCAVATION SHALL BE REFILLED TO THE GRADE OF THE NEW PIPE INVERT WITH CLASS 100–E–100 (60–E–0.7) CONCRETE. THE CONTRACTOR MAY, AT ITS OPTION, SUBSTITUTE MECHANICALLY COMPACTED BACKFILL IN LIEU OF THE CLASS 100–E–100 (60–E0.7) CONCRETE. THOSE PORTIONS OF ABANDONED PIPE NOT REMOVED SHALL BE SEALED. WHERE CAPS ARE USED, THEY SHALL BE SEALED BY FILLING THE SPACE ABOVE THE CAP WITH SAND AND A 1" (25 mm) THICK COATING OF TYPE "F" MORTAR.

10. SUPPORT WALLS SHALL CONFORM TO SPPWC 224.

11. WHEN INDICATED ON THE PLANS OR THE SPECIAL PROVISIONS, A CLEANOUT SHALL BE CONSTRUCTED IN CONJUNCTION WITH CASE E AS FOLLOWS:

    A. SUBSTITUTE A "Y" FOR THE 45° BEND.
    B. PLACE A 45° BEND ON THE UPPER END OF THE "Y".
    C. CAP TOP OF 45° BEND WITH A CAP AND SEAL WITH 1" (25 mm) THICK TYPE "F" MORTAR AROUND THE CIRCUMFERENCE OF THE CAP.

# APPENDIX C

## A

| | |
|---|---|
| aggregate base | |
| asbestos bonded bituminous coated | |
| air-blown mortar | |
| abandon | |
| abutment | |
| asphalt concrete | |
| asphalt concrete base | |
| asbestos cement pipe | |
| added dead load | |
| adjust | |
| alternative flared end section | |
| ahead | |
| alternate | |
| time from midnight to noon | AM |
| alternative pipe | |
| alternative pipe culvert | |
| approximate | Approx |
| alternative pipe underdrain | |
| acceleration response spectrum | |
| aggregate subbase | |
| aluminum spiral rib pipe | |
| assembly | |
| asphalt treated permeable base | |
| asphalt treated permeable material | |
| avenue | |
| average | |
| at | |

## B

| | |
|---|---|
| bridge approach guard railing | |
| beginning of bridge | |
| back-to-back | |
| begin horizontal curve | |
| begin curb return | |
| begin | |
| bituminous coated | |
| back | |
| backfill | |
| building | |
| bridge-log mile | |
| boulevard | |
| bench mark | |
| bottom | |
| bridge | |
| bearing | |
| british thermal unit | |
| begin vertical curve | |
| barbed wire | |

## C

| | |
|---|---|
| cable anchor assembly | |
| calorie | |
| corrugated aluminum pipe | |
| corrugated aluminum pipe arch | |
| construction area sign | |
| concrete barrier | |
| concrete block wall | |
| center to center | |
| center of gravity | |
| channel | Chnl |
| cast iron | CI |
| cast-in-drilled-hole | CIDH |
| cast-in-place, cast iron pipe | CIP |
| cast in place concrete pipe | CIPCP |
| cast-in-steel-shell | CISS |
| complete joint penetration | CJP |
| chain link | CL |
| chain link fence (6 ft) | CL-6 |
| class | Cl |
| clear, clearance | Clr |
| corrugated metal | CM |
| centimeters | cm |
| corrugated metal pipe | CMP |
| county | Co |
| column | Col |
| concrete | Conc |
| conduit | Cond |
| connector | Conn |
| construct, construction | Const |
| continuous | Cont |
| coordinate | Coord |
| candlepower | CP |
| creek | Cr |
| concreted rock slope protection | CRSP |
| corrugated steel pipe | CSP |
| corrugated steel pipe arch | CSPA |
| cement treated base | CTB |
| cement treated permeable base | CTPB |
| cement treated permeable material | CTPM |
| centers | Ctrs |
| culvert | Culv |
| centerline | ℄ |

## D

| | |
|---|---|
| depth | D |
| downdrain | DD |
| double | Dbl |
| degree | Deg |
| delineator | Del |
| detail, detour | Det |
| douglas fir | DF |
| drainage inlet, drop inlet | DI |
| diameter | Dia |
| diaphragm | Diaph |
| distance, district | Dist |
| double metal beam barrier | DMBB |
| drive | Dr |
| double thrie beam barrier | DTBB |
| driveway | Dwy |

## E

| | |
|---|---|
| east | E |
| each | EA |
| easement | Ease |
| end of bridge, eastbound | EB |
| end horizontal curve | EC |
| end curb return | ECR |
| edge drain | ED |
| edge drain cleanout | EDC |
| edge drain outlet | EDO |
| edge drain vent | EDV |
| electrolier | Elec |
| electric | Elect |
| elevation | Elev |
| embankment | Emb |
| Engineer | Engr |
| edge of deck | EOD |
| edge of pavement | EP |
| equation | Eq |
| edge of shoulder | ES |
| edge of traveled way | ETW |
| end vertical curve | EVC |
| endwall | EW |
| excavation | Exc |
| existing | Exist, (E) |
| expansion, expressway | Exp |
| expansion joint | Exp Jt |
| exterior | Ext |

## F

| | |
|---|---|
| frame and cover | F & C |
| frame and grate | F & G |
| floor beam | FB |
| foundation | Fdn |
| facing eastbound traffic | FEBT |
| flared end section | FES |
| filter fabric | FF |
| finished grade | FG |
| fire hydrant | FH |
| figure | Fig |
| flow line | FL |
| facing northbound traffic | FNBT |
| free on board | FOB |
| face of concrete | FOC |
| frontage road | Fr Rd |
| far side, finished surface | FS |
| facing southbound traffic | FSBT |
| footing | Ftg |
| facing westbound traffic | FWBT |
| freeway | Fwy |

## G

| | |
|---|---|
| acceleration due to gravity | g |
| gage | Ga |
| galvanized | Galv |
| grading plane | GP |
| guard railing | GR |
| galvanized steel pipe | GSP |
| gutter | Gtr |

## H

| | |
|---|---|
| height | H |
| hour | h, hr |
| horizontal drain | HD |
| headwall | hdwl |
| hexagonal head | Hex Hd |
| horizontal | Horiz |
| hinge point, horsepower | HP |
| high performance steel | HPS |
| high strength | HS |
| headwall, high water | HW |
| high water mark | HWM |
| highway | Hwy |

## I

| | |
|---|---|
| imported borrow | IB |
| inside diameter | ID |
| inside face | IF |
| interior | Int |
| invert | Inv |
| irrigation | Irr |

## J

| | |
|---|---|
| junction | Jct |
| joint pole | JP |
| jointed plain concrete pavement | JPCP |
| junction structure | JS |
| joint | Jt |

## K

| | |
|---|---|
| kilometer (always lower case) | km |
| kilometer post | KP |

## L

| | |
|---|---|
| length | L |
| latitude | Lat |
| lean concrete base | LCB |
| lane | Ln |
| location | Loc |
| layout line | LOL |
| longitude | Long |
| longitudinal | Longit |
| lump sum | LS |
| left | Lt |

Caltrans Metric

| DIST | COUNTY | ROUTE | KILOMETER POST TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

July 1, 2004
PLANS APPROVAL DATE

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

REGISTERED PROFESSIONAL ENGINEER — Terrie Ware — No. 54638 — Exp. 12-31-05 — CIVIL — STATE OF CALIFORNIA

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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

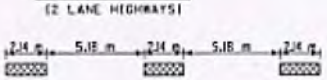
# ACRONYMS AND ABBREVIATIONS (A-L)

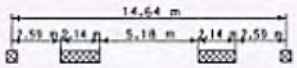
NO SCALE

A10A

2004 Std PLAN A10A

## CENTERLINES
(2 LANE HIGHWAYS)

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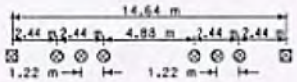
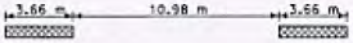
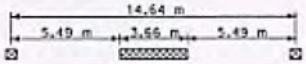
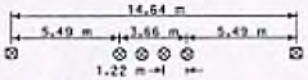
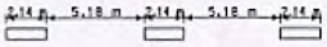


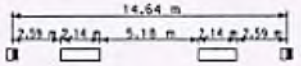



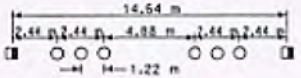



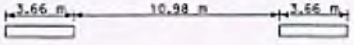




## LANELINES
(MULTILANE HIGHWAYS)



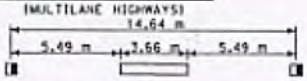



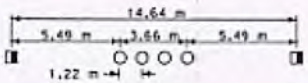




## LANELINES (CONT)
(MULTILANE HIGHWAYS)

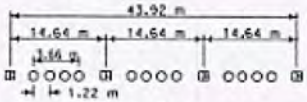
DETAIL 12



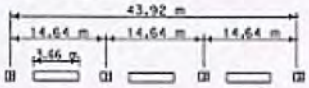

DETAIL 13




DETAIL 14

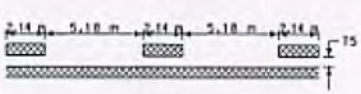



DETAIL 14A

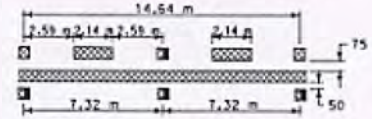



## NO PASSING ZONES-ONE DIRECTION

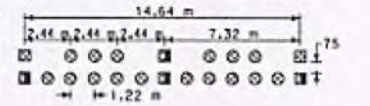
DETAIL 15



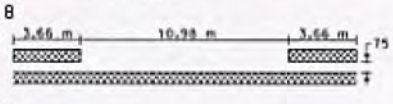

DETAIL 16



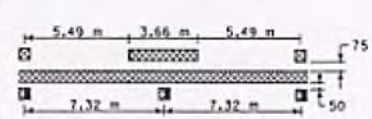

DETAIL 17



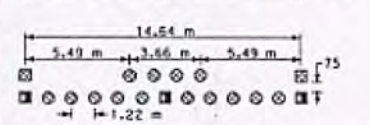

DETAIL 18




DETAIL 19



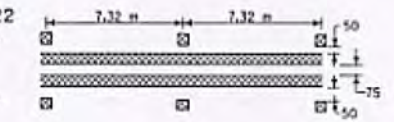

DETAIL 20



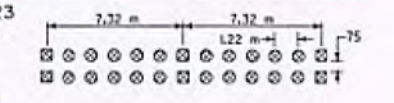

## NO PASSING ZONES-TWO DIRECTION

DETAIL 21


DETAIL 22




DETAIL 23




## LEGEND

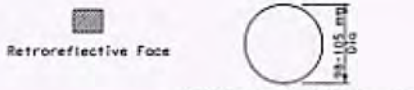
MARKERS

- TYPE A White Non-reflective
- TYPE AY Yellow Non-reflective
- TYPE C Red-clear Retroreflective
- TYPE D Two-way Yellow Retroreflective
- TYPE G One-way Clear Retroreflective
- TYPE H One-way Yellow Retroreflective

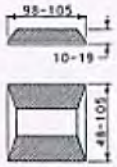
LINES

- 100 mm White
- 100 mm Yellow
- Direction of Travel

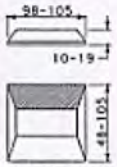
## MARKER DETAILS




TYPE A & TYPE AY

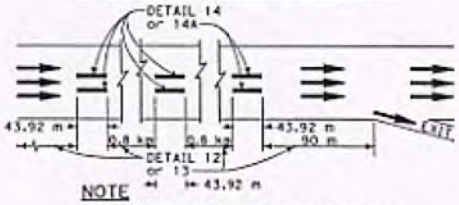



TYPE C & TYPE D




TYPE G & TYPE H

## TYPICAL LANE LINE DELINEATION IN ADVANCE OF EXIT RAMP




NOTE

Detail 14 is to be used in combination with Detail 13. Detail 14A is to be used in combination with Detail 12.

Caltrans Metric

| DIST | COUNTY | ROUTE | KILOMETER POST TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

Donald E. Shaw
REGISTERED CIVIL ENGINEER
July 1, 2004
PLANS APPROVAL DATE
Donald E. Shaw C46402 Exp. 3-31-07 CIVIL STATE OF CALIFORNIA
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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# PAVEMENT MARKERS AND TRAFFIC LINES TYPICAL DETAILS

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

**A20A**

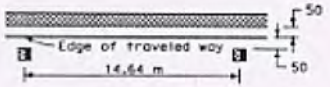
2004 Std PLAN A20A

## LEFT EDGELINES

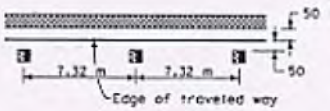
(DIVIDED HIGHWAYS)

24

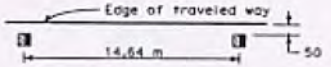

25



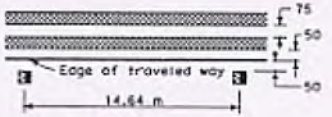

25A




26




27

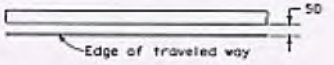



## RIGHT EDGELINES

27A

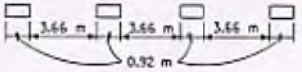
Detail 27A deleted

27B



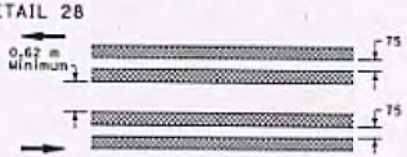

## T EDGELINE EXTENSION THROUGH INTERSECTIONS

27C

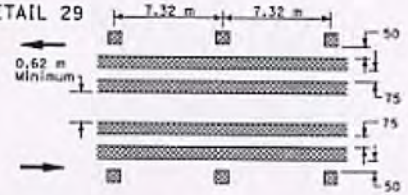



## MEDIAN ISLANDS

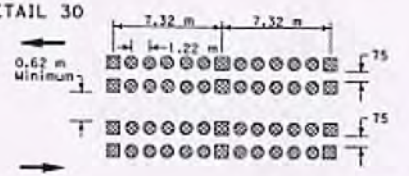
DETAIL 28




DETAIL 29




DETAIL 30




## LEGEND

MARKERS

- TYPE AY Yellow Non-reflective
- TYPE D Two-way Yellow Retroreflective
- TYPE H One-way Yellow Retroreflective

LINES

- 100 mm White
- 100 mm Yellow
- Direction of Travel

Caltrans Metric

| DIST | COUNTY | ROUTE | REGISTERED POST TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

Donald C. Howe
REGISTERED CIVIL ENGINEER

July 1, 2004
PLANS APPROVAL DATE

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Donald C. Howe No. C46402 Exp. 3-31-05 CIVIL STATE OF CALIFORNIA

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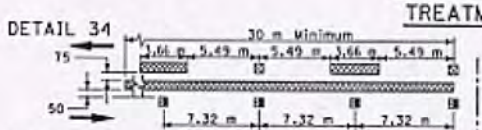
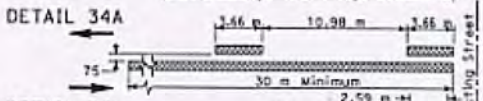
## INTERSECTION TREATMENTS

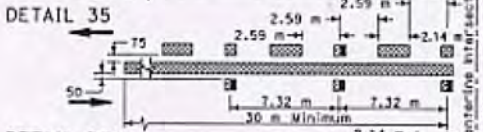
DETAIL 34



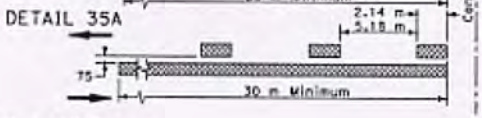

DETAIL 34A



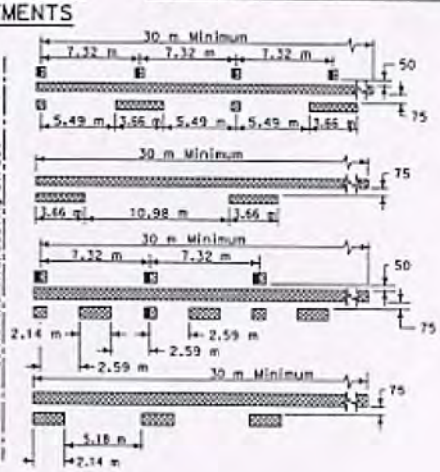

DETAIL 35




DETAIL 35A

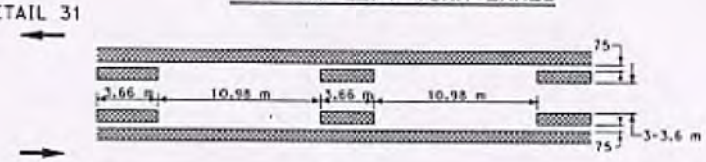



Centerline intersecting Street

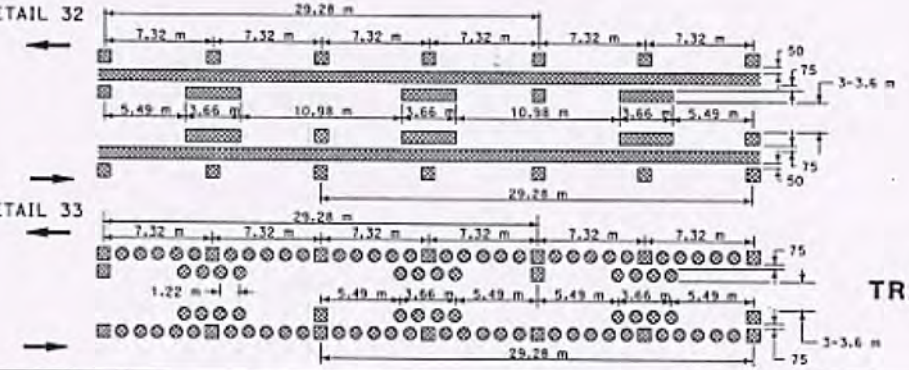



## TWO-WAY LEFT TURN LANES

DETAIL 31



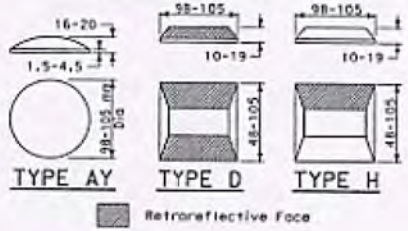

DETAIL 32




DETAIL 33




## MARKER DETAILS




STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# PAVEMENT MARKERS AND TRAFFIC LINES TYPICAL DETAILS

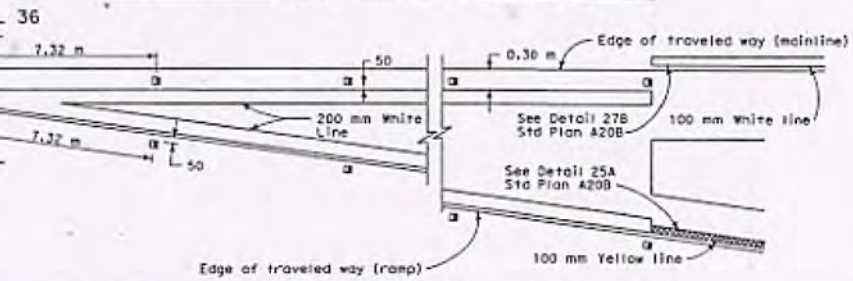
NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

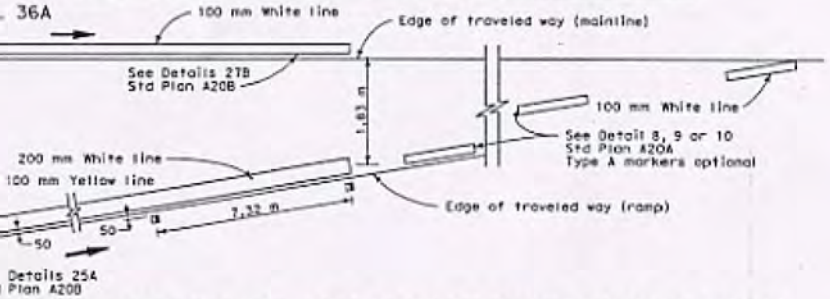
A20B

2004 Std PLAN A20B

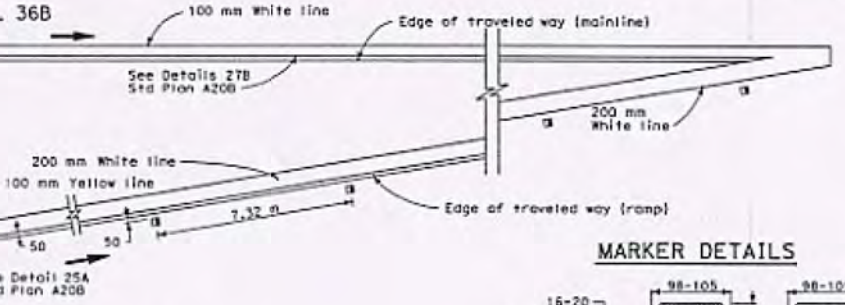
## EXIT RAMP NEUTRAL AREA (GORE) TREATMENT



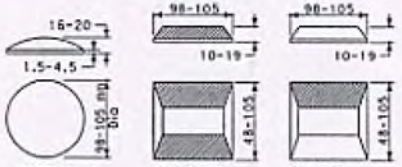

## ENTRANCE RAMP NEUTRAL AREA (MERGE) TREATMENT




## ENTRANCE RAMP NEUTRAL AREA (ACCELERATION LANE) TREATMENT




## MARKER DETAILS




LEGEND

MARKERS

- TYPE A White Non-reflective
- TYPE C Red-clear Retroreflective
- TYPE G One-way Clear Retroreflective
- Direction of Travel

Caltrans District Metric

| DIST | COUNTY | ROUTE | KILOMETER POST TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

Donald C. Howe
REGISTERED CIVIL ENGINEER

July 1, 2004
PLANS APPROVAL DATE

Donald E. Howe, C46422, Exp. 3-31-05, CIVIL, State of California

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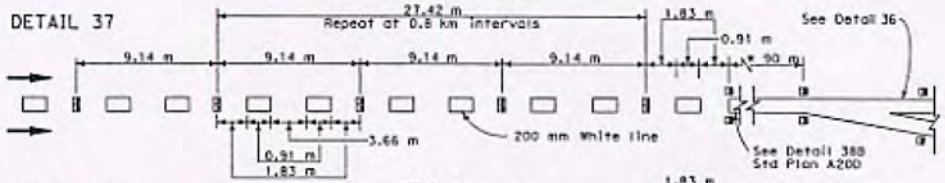
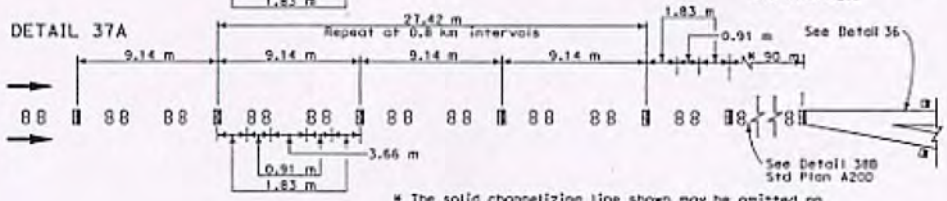
## LANE DROP AT EXIT RAMPS

DETAIL 37



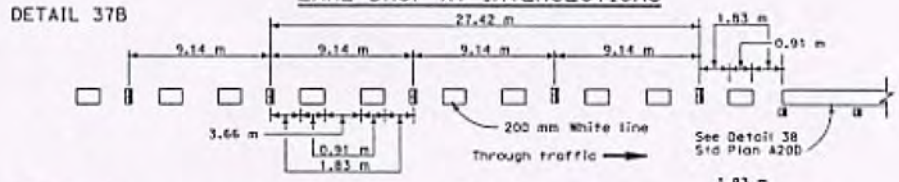

DETAIL 37A



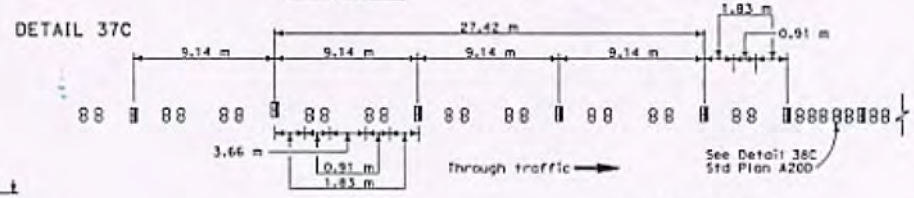

* The solid channelizing line shown may be omitted on short auxiliary lanes where weaving length is critical.

## LANE DROP AT INTERSECTIONS

DETAIL 37B




DETAIL 37C




STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# PAVEMENT MARKERS AND TRAFFIC LINE TYPICAL DETAILS

NO SCALE

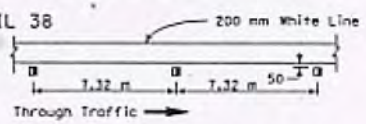
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

**A20C**

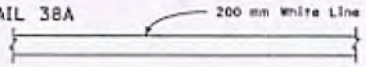
2004 Std PLAN A20C

## CHANNELIZING LINE

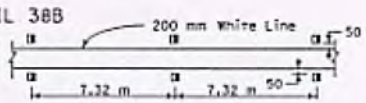
AIL 38



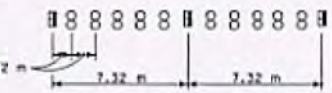

AIL 38A




AIL 38B




AIL 38C

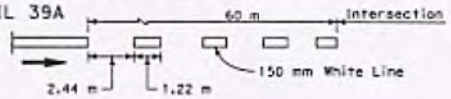



## BIKE LANE LINE

AIL 39


## INTERSECTION LINE
## BIKE LANE

AIL 39A

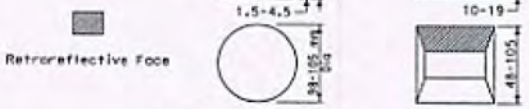



## LEGEND

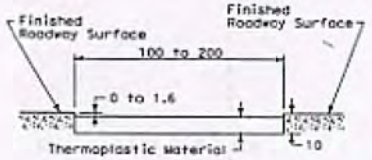
MARKERS

- TYPE A White Non-reflective
- TYPE AY Yellow Non-Reflective
- TYPE G One-way Clear Retroreflective
- 100 mm Yellow Line
- Direction of Travel

## MARKER DETAILS




TYPE A & TYPE AY TYPE G




## DETAIL FOR RECESSED THERMOPLASTIC TRAFFIC STRIPE

See Notes A and B.

### RECESSED THERMOPLASTIC NOTES

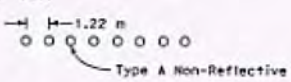
A. See typical traffic line details for pavement marking patterns.

B. The top of the thermoplastic installed in recessed pavement shall be 0 to 1.6 mm below the pavement surface.

## LANE LINE EXTENSIONS THROUGH INTERSECTIONS

AIL 40

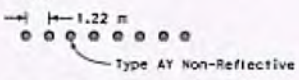

DETAIL 40A




## CENTER LINE EXTENSIONS THROUGH INTERSECTIONS

AIL 41


DETAIL 41A

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Donald E. Howe
REGISTERED CIVIL ENGINEER

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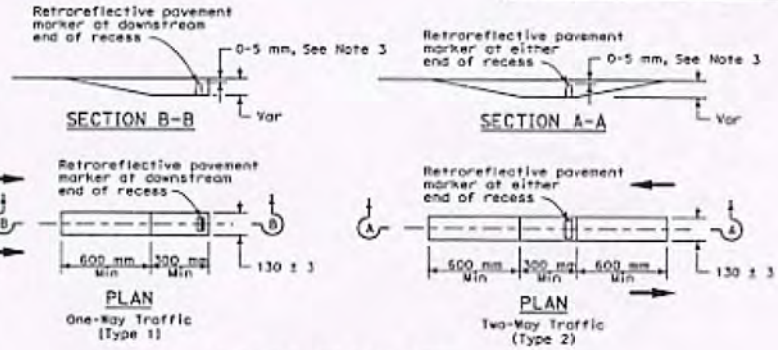
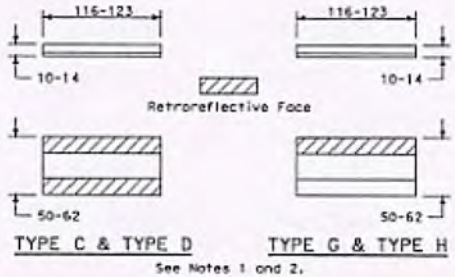



## RECESS DETAIL FOR RETROREFLECTIVE PAVEMENT MARKER




See Notes 1 and 2.

## RETROREFLECTIVE PAVEMENT MARKER FOR RECESSED INSTALLATION

### RECESSED MARKER NOTES

1. See typical traffic line details for marker patterns to be used with recessed pavement markers. Detail 14 requires a Type 2 recess.
2. The retroreflective pavement markers shown for recessed installations are not to be used for non-recessed installations.
3. The top of pavement markers installed in recesses shall be 0-5 mm below the pavement surface.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# PAVEMENT MARKERS AND TRAFFIC LINES TYPICAL DETAILS

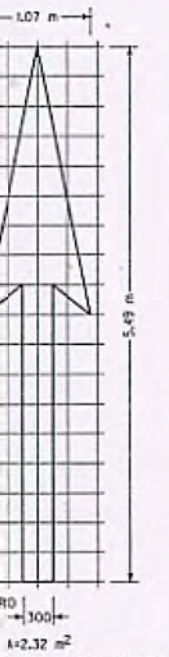
NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

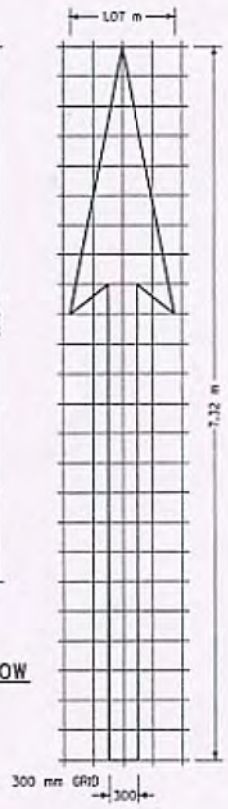
**A20D**

2004 Std PLAN A20D

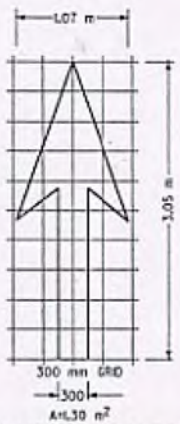
01-22-04



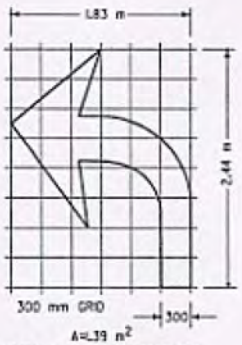

5.49 m) ARROW




TYPE I (7.32 m) ARROW

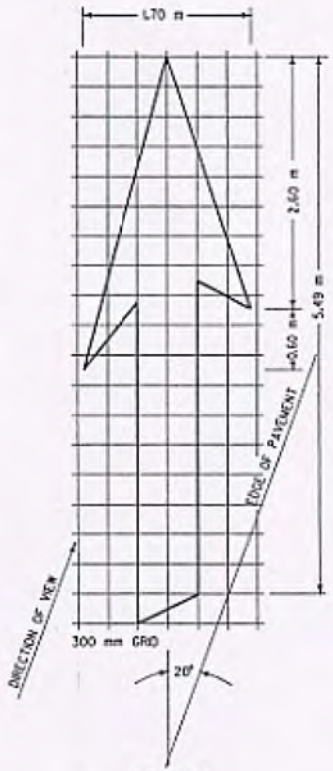



TYPE I (3.05 m) ARROW



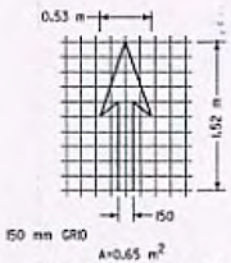

TYPE IV (L) ARROW

(FOR TYPE IV(R) ARROW, USE MIRROR IMAGE)

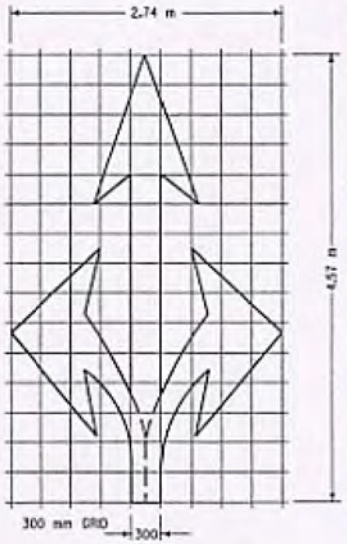



TYPE VI ARROW

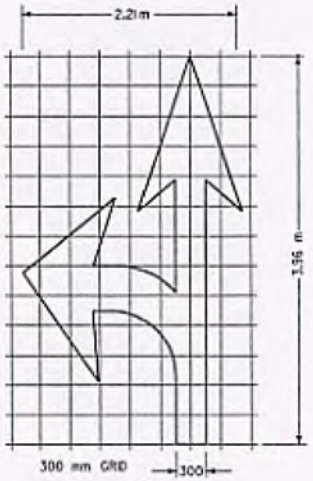
RIGHT LANE DROP ARROW (FOR LEFT LANE, USE MIRROR IMAGE)




BIKE LANE ARROW




TYPE VIII ARROW




TYPE VII (L) ARROW

(FOR TYPE VII (R) ARROW, USE MIRROR IMAGE)

NOTE

MINOR VARIATIONS IN DIMENSIONS MAY BE ACCEPTED BY THE ENGINEER.

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Donald E. Howe
REGISTERED CIVIL ENGINEER

July 1, 2004
PLANS APPROVAL DATE

Donald E. Howe
C46402
Exp. 3-31-05
CIVIL
STATE OF CALIFORNIA

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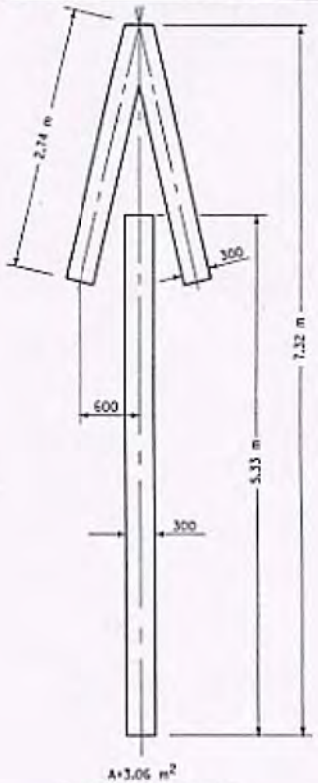



TYPE V ARROW

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

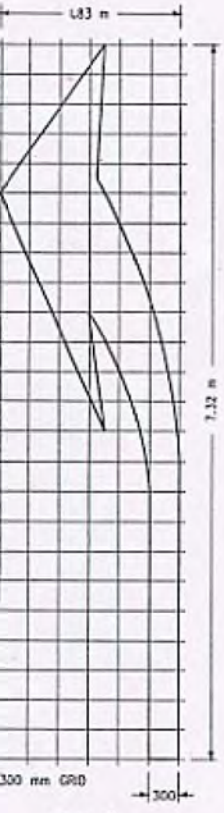
# PAVEMENT MARKINGS ARROWS

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

A24A

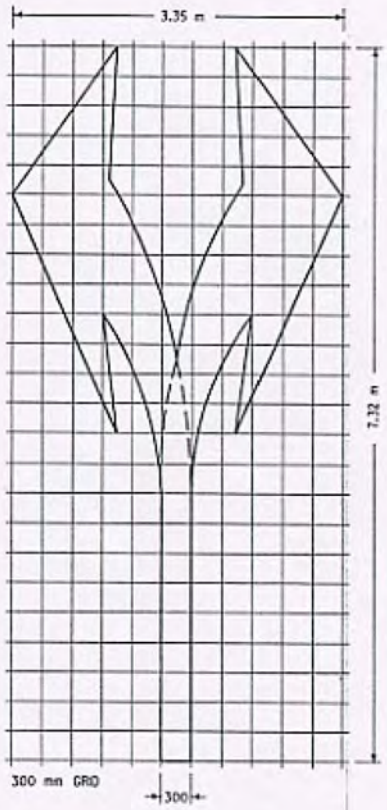
2004 Std PLAN A24A




A=3.90 m²

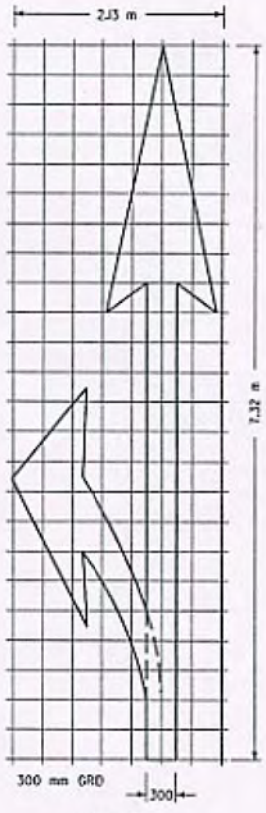
TYPE III(L) ARROW

(TYPE III(R) USE MIRROR IMAGE)




A=6.78 m²

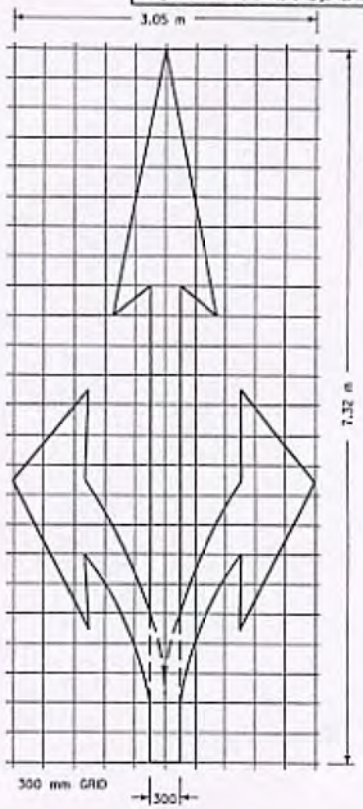
TYPE III(B) ARROW




A=4.28 m²

TYPE II(L) ARROW

(FOR TYPE II(R) USE MIRROR IMAGE)




A=5.48 m²

TYPE II(B) ARROW

NOTE

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Donald E. Howe
REGISTERED CIVIL ENGINEER

July 1, 2004
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Donald E. Howe
No. C46402
12-31-04
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# PAVEMENT MARKINGS ARROWS

NO SCALE

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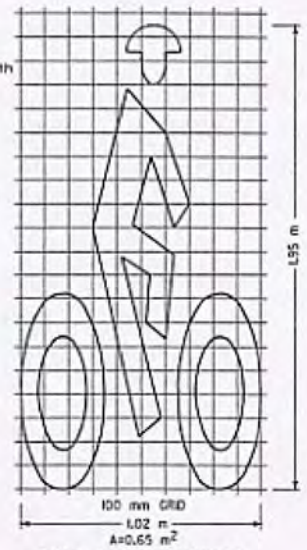
A24B

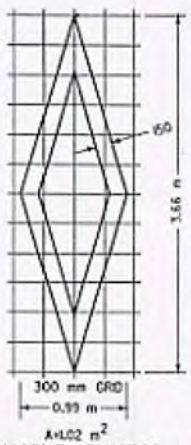
2004 Std PLAN A24B


OAD CROSSING SYMBOL

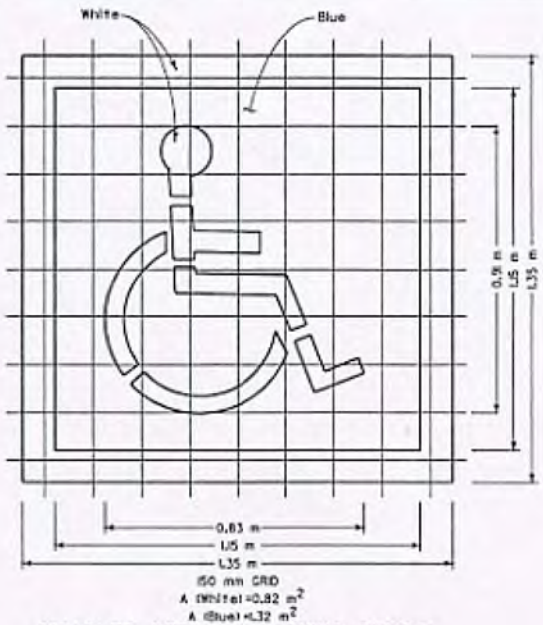
DES NOT INCLUDE THE 0.6 m x VARIABLE NSVERSE LINES.




BIKE LANE SYMBOL

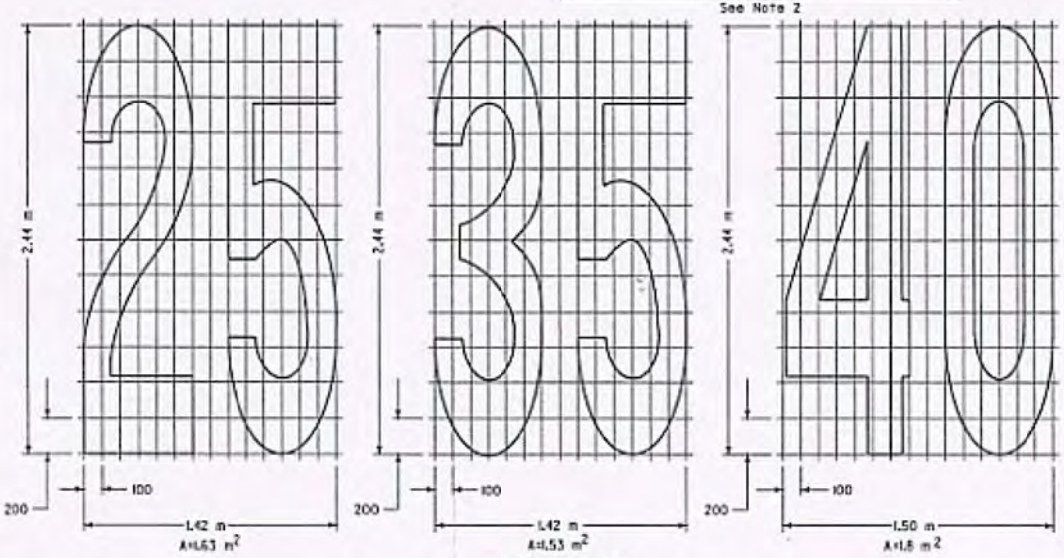



DIAMOND SYMBOL

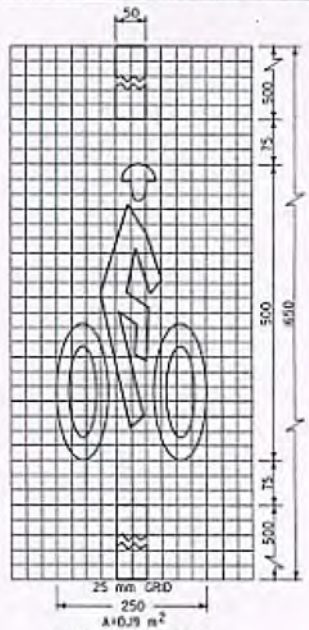



DISABLED PERSONS PARKING SYMBOL

See Note 2




NUMERALS




BICYCLE LOOP DETECTOR SYMBOL

NOTES

1. Minor variations in dimensions may be accepted by the Engineer.
2. This parking symbol is also known as the International Symbol of Accessibility (ISA)

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Donald C. Howe
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# PAVEMENT MARKINGS SYMBOLS AND NUMERALS

NO SCALE

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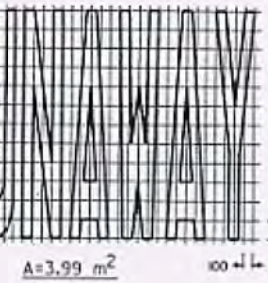
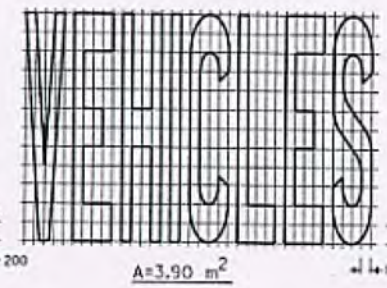
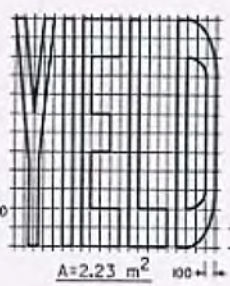
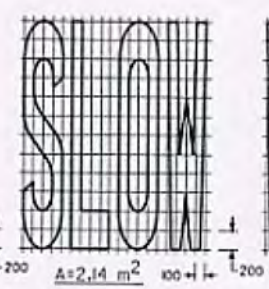
A24C

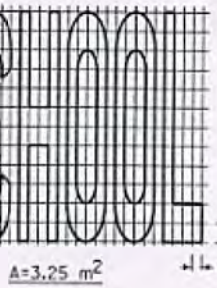
2004 Std PLAN A24C

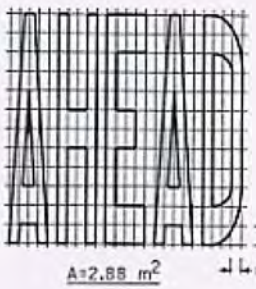


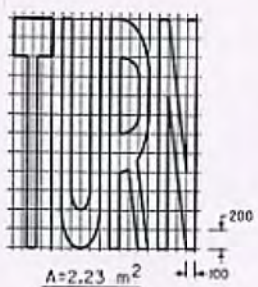



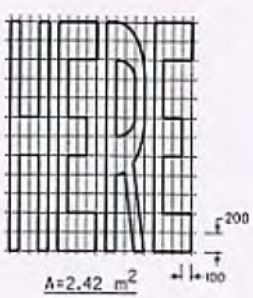



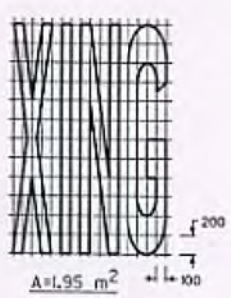



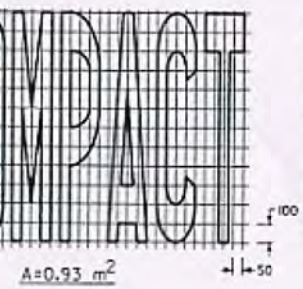



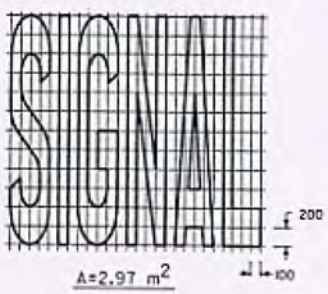



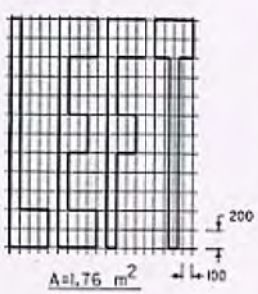



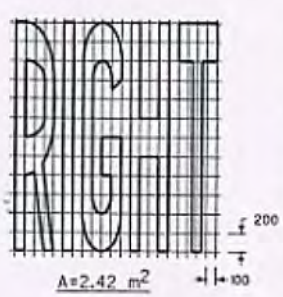



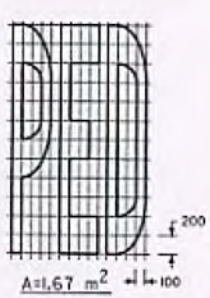



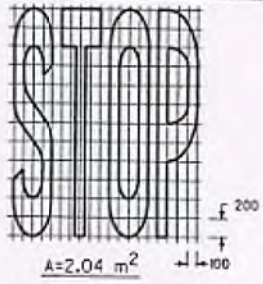



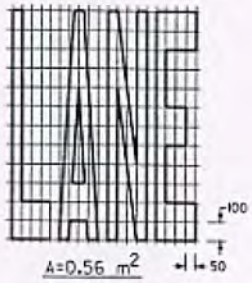



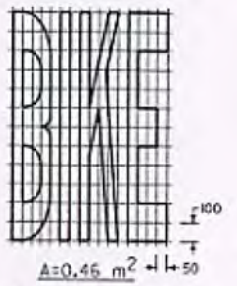




message consists of more than one word, it should "up", i.e., the first word should be nearest the driver.

space between words should be at least four times height of the characters for low speed roads, but more than ten times the height of the characters. space may be reduced appropriately where there is ed space because of local conditions.

(3) Minor variations in dimensions may be accepted by the Engineer.

(4) Portions of a letter, number or symbol may be separated by connecting segments not to exceed 50 mm in width.

WORD MARKINGS

| ITEM | m² | ITEM | m² | ITEM | m² | ITEM | m² |
|---|---|---|---|---|---|---|---|
| XING | 1.95 | YIELD | 2.23 | BIKE | 0.46 | PED | 1.67 |
| AHEAD | 2.88 | SCHOOL | 3.25 | SLOW | 2.14 | COMPACT | 0.93 |
| WAIT | 1.76 | SIGNAL | 2.97 | STOP | 2.04 | RUNAWAY | 3.99 |
| LANE | 0.56 | TURN | 2.23 | LEFT | 1.76 | VEHICLES | 3.90 |
| RIGHT | 2.42 | HERE | 2.42 | | | | |

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Donald E. Howe
REGISTERED CIVIL ENGINEER

July 1, 2004
PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER — Donald E. Howe — No. C46492 — Exp. 3-31-05 — CIVIL — STATE OF CALIFORNIA

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STATE OF CALIFORNIA
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# PAVEMENT MARKINGS WORDS

NO SCALE

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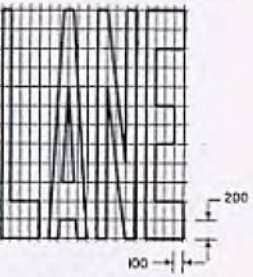
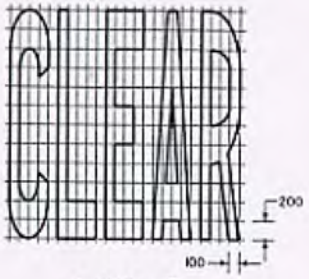
A24D

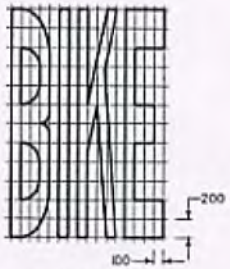
2004 Std PLAN A24D



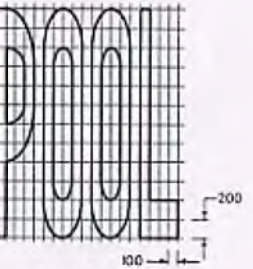

A=2.23 m²



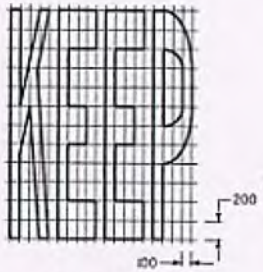

A=2.51 m²



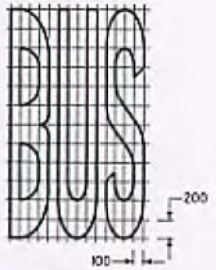

A=1.95 m²



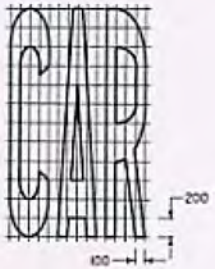

A=2.14 m²



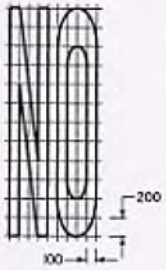

A=2.23 m²



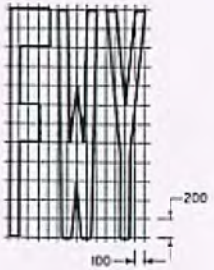

A=1.86 m²



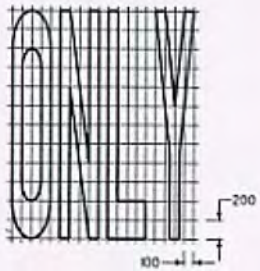

A=1.58 m²




A=1.30 m²




A=1.49 m²




A=2.04 m²


A=0.21 m²

See Notes 6 and 7

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Donald E. Howe
REGISTERED CIVIL ENGINEER

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Donald E. Howe, No. C46422, Exp. 3-31-05, CIVIL, REGISTERED PROFESSIONAL ENGINEER, STATE OF CALIFORNIA

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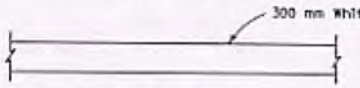
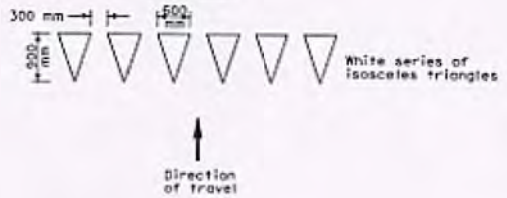
## CROSSWALK AND LIMIT LINE

See Note 5




## YIELD LINE




2004 Std PLAN A24E

sage consists of more than one word, it should read "UP", first word should be nearest the driver.

e between words should be at least four times the height characters for low speed roads, but not more than ten times ht of the characters. The space may be reduced ately where there is limited space because of local conditions.

riations in dimensions may be accepted by the Engineer.

of a letter, number or symbol may be separated by connecting not to exceed 50 mm in width.

5. Crosswalks contiguous to school grounds are to be 300 mm yellow lines in place of 300 mm white shown.

6. The words "NO PARKING" pavement marking is to be used for parking facilities. For typical locations of markings, see Standard Plans A90A and A90B.

7. The words "NO PARKING", shall be painted in white letters no less than 300 mm high on a contrasting background and located so that it is visible to traffic enforcement officials.

| WORD MARKINGS | | | |
|---|---|---|---|
| ITEM | m² | ITEM | m² |
| LANE | 2.23 | NO | 1.30 |
| POOL | 2.14 | BIKE | 1.95 |
| CAR | 1.58 | BUS | 1.86 |
| CLEAR | 2.51 | ONLY | 2.04 |
| KEEP | 2.23 | FWY | 1.49 |

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# PAVEMENT MARKINGS WORDS AND CROSSWALKS

NO SCALE

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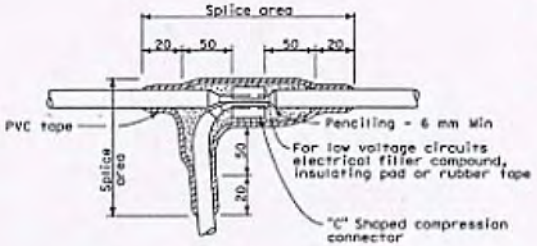
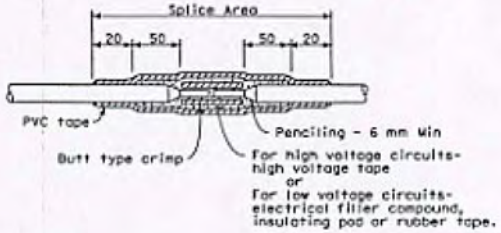
A24E



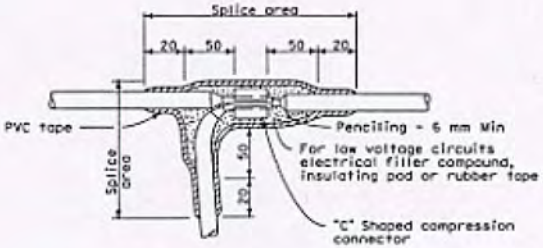

## TYPE "C" SPLICE

Between 1 free-end and 1 through conductor



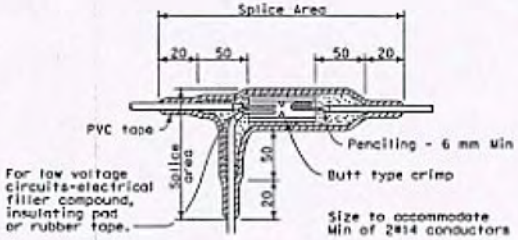

## TYPE "S" SPLICE

Between 2 free-ends




## TYPE "T" SPLICE

For 3 free-ends




## TYPE "ST" SPLICE

### NOTES

1. Dimensions are minimum.
2. Rubber tapes shall be rolled after application.

### INSULATION METHODS

#### Low Voltage Circuits (0-600 V)

METHOD "B"

1. Completely cover the splice area with electrical insulating coating and allow to dry.
2. Apply 2 layers of electrical insulating pad with minimum thickness of 4 mm each layer or 2 layers, half lapped, synthetic oil resistant, self fusing rubber tape.
3. Apply 3 layers half lapped polyvinyl chloride tape.
4. Cover entire splice with electrical insulating coating and allow to dry.

#### High Voltage Circuits (Over 600 V)

1. Completely cover the splice area with electrical insulating coating and allow to dry.
2. Apply high voltage tape to a minimum thickness equal to original insulation.
3. Apply 3 layers half lapped polyvinyl chloride tape.
4. Cover entire splice with electrical insulating coating and allow to dry.

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STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# ELECTRICAL SYSTEMS (SPLICING DETAILS)

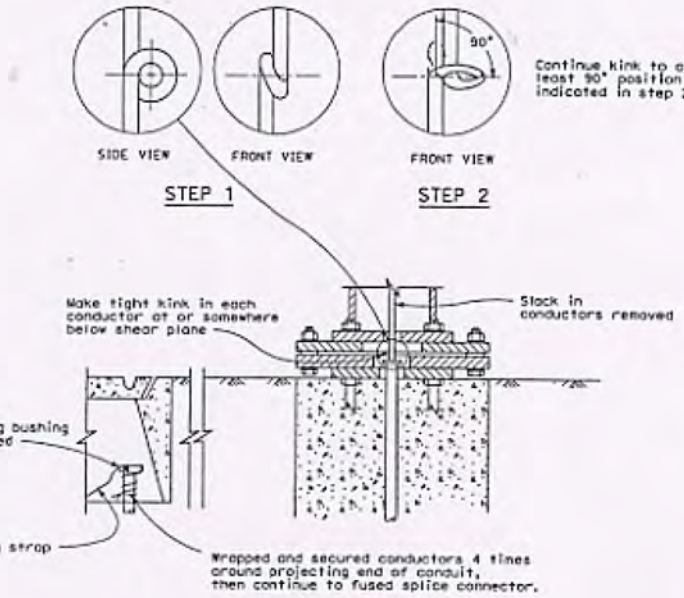
NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

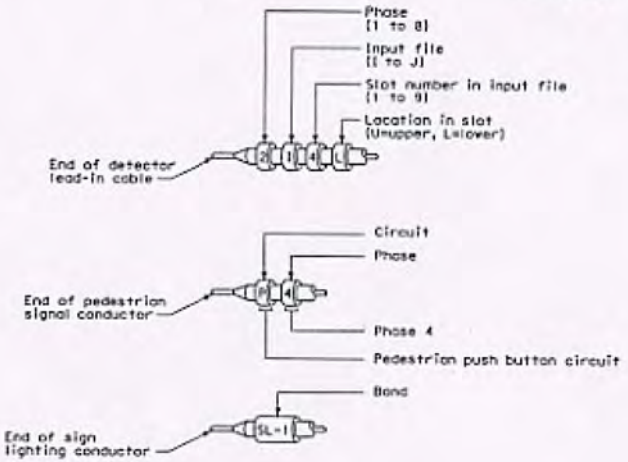
ES-13A

2004 Std PLAN ES-13A

21-21-04




## KINKING DETAIL FOR SLIP BASE STANDARDS




## TYPICAL BANDING OF CONDUCTOR ENDS

Primary lines of multiple ballasts shall be provided with fused connectors.
Fuse ratings shall be as noted below.

| CIRCUIT VOLTAGE | FUSE VOLTAGE RATING | FUSE CURRENT RATING | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HPS LAMP BALLAST | | | | | | | LOW PRESSURE SODIUM BALLAST | | | | | INDUCTION SIGN LIGHTING | MULTIPLE TO MULTIPLE TRANSFORMERS (PRIMARY SIDE) | | |
| | | 70 W | 100 W | 150 W | 200 W | 250 W | 310 W | 400 W | 35 W | 55 W | 90 W | 135 W | 180 W | 85 W | 1 kVA | 2 kVA | 3 kVA |
| 120 V | 250 V | 5 | 5 | 5 | 5 | 6 | 10 | 10 | 5 | 5 | 8 | 10 | 10 | 5 | 10 | 25 | 35 |
| 240 V | 250 V | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 | 3 | 4 | 5 | 5 | 5 | 6 | 10 | 20 |
| 480 V | 500-600 V | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 2 | 2 | 2 | 3 | 3 | 1* | 3 | 6 | 10 |

* See Standard Plan ES-150, Type SC3 Control.

## FUSE RATINGS FOR FUSED CONNECTORS

## LUMINAIRE BALLAST FUSING

Caltrans Metric

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# ELECTRICAL SYSTEMS (WIRING DETAILS AND FUSE RATINGS)

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

**ES-13B**

2004 Std PLAN ES-13B

## OP INSTALLATION PROCEDURE

Loops shall be centered in lanes.

Saw slots in pavement for loop conductors as shown in details.

Distance between side of loop and a lead-in saw cut from adjacent detectors shall be 600 mm minimum. Distance between lead-in saw cuts shall be 150 mm minimum.

Bottom of saw slot shall be smooth with no sharp edges.

Slots shall be washed until clean, blown out and thoroughly dried before installing loop conductors.

Adjacent loops on the same sensor unit channel shall be wound in opposite directions.

Identify and tag loop circuit pairs in the pull box with loop number, start (S) and finish (F) of conductor. Identify and tag lead-in-cable with sensor number and phase.

Install loop conductor in slot using a 5 mm to 6 mm thick wood paddle. Hold loop conductors with wood paddles (at the bottom of the sawed slot) during sealant placement.

No more than 2 twisted pairs shall be installed in one sawed slot.

Allow additional 1.5 m of slack length of conductor for the lead-in run to pull box.

The additional length of each conductor for each loop shall be twisted together into a pair (6 turns per meter minimum) before being placed in the slot and conduit leading to pull box.

Test each loop circuit for continuity, circuit resistance and insulation resistance at the pull box before filling slots.

Fill slots as shown in details.

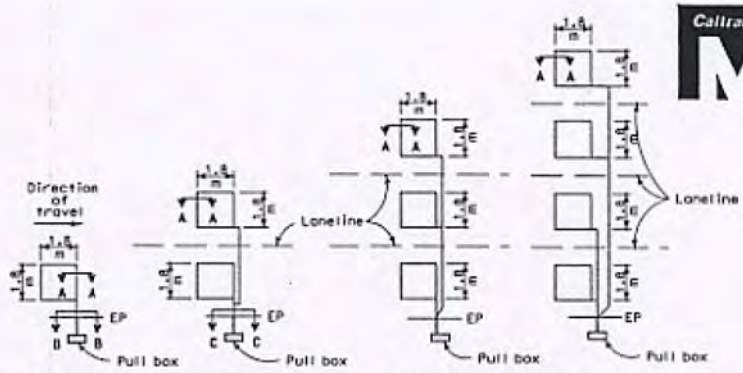
Splice loop conductors to lead-in cable. Splices shall be soldered.

End of lead-in-cable and Type 2 loop conductor shall be waterproofed prior to installing in conduit to prevent moisture from entering the cable.

Lead-in-cable shall not be spliced between the pull box and the controller cabinet terminals.

Test each loop circuit for continuity, circuit resistance and insulation resistance at the controller cabinet location.

Where loop conductors are not to be spliced to a lead-in-cable, the ends of the conductors shall be taped and waterproofed with electrical insulating coating.

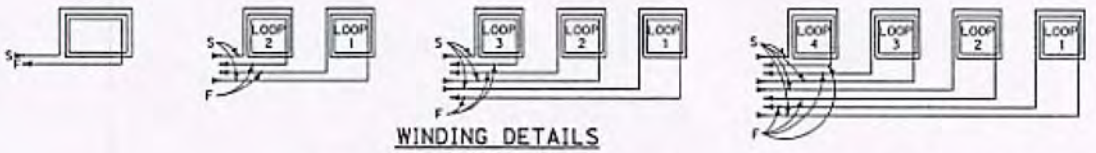



TYPE 1A INSTALLATION | TYPE 2A INSTALLATION | TYPE 3A INSTALLATION | TYPE 4A INSTALLATION

## SAWCUT DETAILS

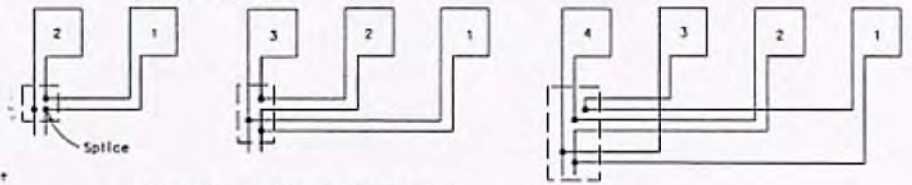
(Type A loop detector configurations illustrated)

1. 1A thru 4A = 1 Type A loop configuration in each lane.
2. 1B thru 4B = 1 Type B loop configuration in each lane.
3. 1C = 1 Type C loop configuration entering lanes as required.
4. 1D thru 4D = 1 Type D loop configuration in each lane.
5. 1E thru 4E = 1 Type E loop configuration in each lane.
6. 1Q thru 4Q = 1 Type Q loop configuration in each lane. (Use Type A, B, C, D, E or Q loop detector configurations only when specified or shown on plans)



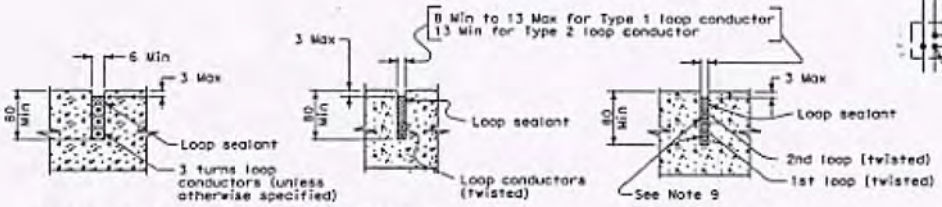

## WINDING DETAILS

See Notes 6 and 7




## TYPICAL LOOP CONNECTIONS

(Dashed lines represent the pull box)




SECTION A-A | SECTION B-B | SECTION C-C

## SLOT DETAILS - TYPE 1 AND TYPE 2 LOOP CONDUCTOR

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# ELECTRICAL SYSTEMS (DETECTORS)

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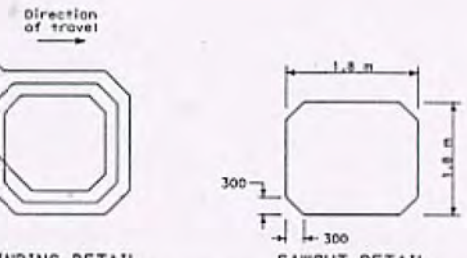
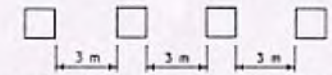
ES-5A

2004 Std PLAN ES-5A



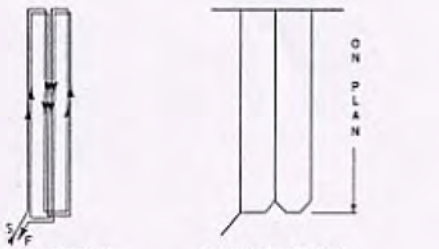

INDING DETAIL  SAWCUT DETAIL

PE A LOOP DETECTOR CONFIGURATION



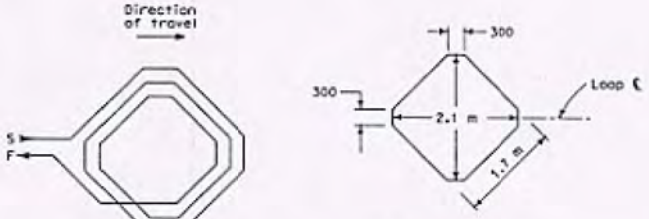

TYPICAL TYPE A INSTALLATION

Single Lane



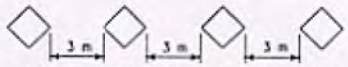

DING DETAIL  SAWCUT DETAIL

C LOOP DETECTOR CONFIGURATION



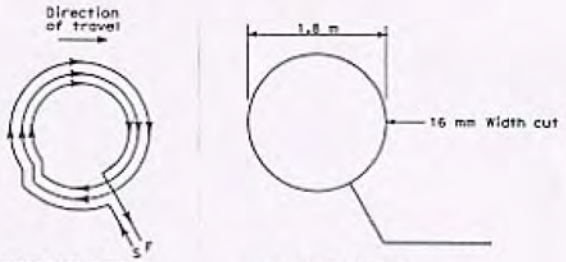

WINDING DETAIL  SAWCUT DETAIL

TYPE B LOOP DETECTOR CONFIGURATION



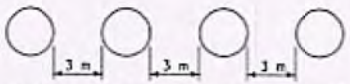

TYPICAL TYPE B INSTALLATION

Single Lane



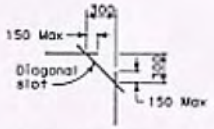

WINDING DETAIL  SAWCUT DETAIL

TYPE E LOOP DETECTOR CONFIGURATION

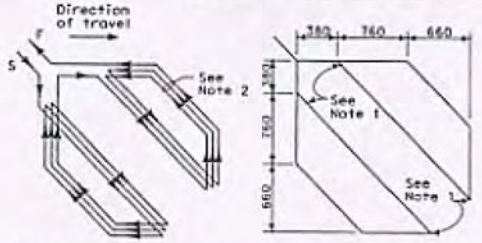



TYPICAL TYPE E INSTALLATION

Single Lane




PLAN VIEW OF DIAGONAL SLOT AT CORNERS

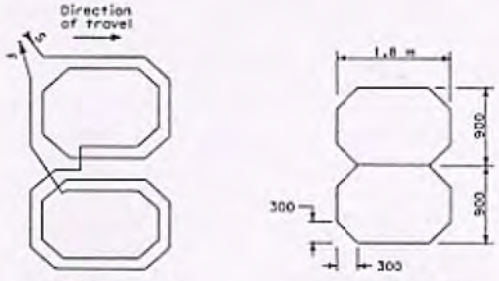



WINDING DETAIL  SAWCUT DETAIL

TYPE D LOOP DETECTOR CONFIGURATION

NOTES

1. Round corners of acute angle sawcuts to prevent damage to conductors.
2. Install 3 turns when only one Type D loop is on a sensor unit channel. Install 5 turns when one Type D loop is connected with 3 additional 1.8 m x 1.8 m loops on a sensor unit.




WINDING DETAIL  SAWCUT DETAIL

TYPE Q LOOP DETECTOR CONFIGURATION

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# ELECTRICAL SYSTEMS (DETECTORS)

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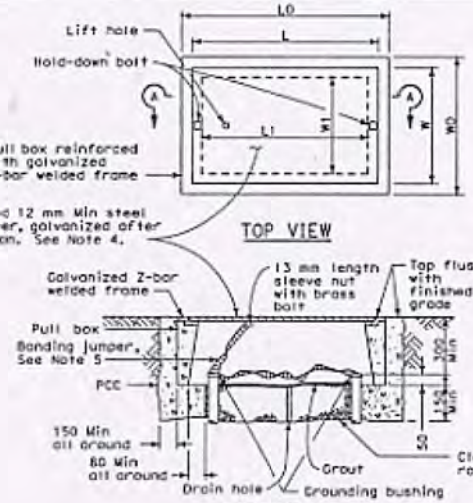
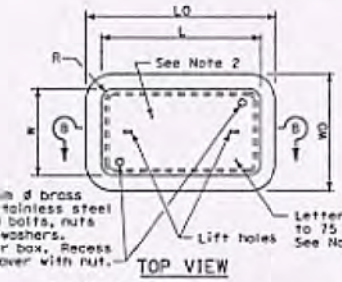
ES-5B

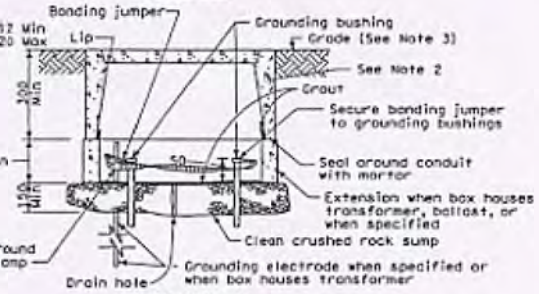
2004 Std PLAN ES-5B




SECTION A-A

## No. 3½(T), No. 5(T) AND No. 6(T) TRAFFIC PULL BOX




SECTION B-B

INSTALLATION DETAILS

## DIMENSION TABLE

| PULL BOX | CONCRETE BOX | | | | NON-PCC BOX | | CONCRETE OR NON-PCC COVERS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Minimum * Thickness | Minimum Depth Box and Extension | WO (mm) | LO (mm) | Minimum ** Thickness | Minimum Depth Box and Extension | L ** (mm) | W ** (mm) | R (mm) | Edge Thickness | Edge Taper |
| No. 3½ | 25 mm | No Extension | 260 | 510 | 8 mm | No Extension | 390 | 260 | 30 | 45 mm | 3 mm |
| No. 5 | 25 mm | 560 mm | 460 | 710 | 8 mm | 510 mm | 590 | 350 | 32 | 50 mm | 3 mm |
| No. 6 | 40 mm | 600 mm | 580 | 910 | 10 mm | 510 mm | 780 | 450 | 32 | 50 mm | 3 mm |

* Excluding conduit web ** Top dimension

## DIMENSION TABLE

| PULL BOX | CONCRETE BOX | | | | | | NON-PCC BOX | | CONCRETE OR NON-PCC COVERS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Minimum * Thickness | Minimum Depth Box and Extension | WO (mm) | LO (mm) | WI (mm) | LI (mm) | Minimum ** Thickness | Minimum Depth Box and Extension | L ** (mm) | W ** (mm) | R (mm) | Edge Thickness | Edge Taper |
| No. 3½(T) | 40 mm | 300 mm | 430 ± 25 | 530 ± | 370 ± | 270 ± 25 | Does Not Apply | | 510 ± | 350 ± | 0 | 13 mm | None |
| No. 5(T) | 45 mm | 300 mm | 600 ± 25 | 750 ± | 480 ± | 330 ± 25 | Does Not Apply | | 690 ± | 410 ± | 0 | 13 mm | None |
| No. 6(T) | 50 mm | 300 mm | 760 ± 25 | 900 ± | 600 ± | 430 ± 25 | Does Not Apply | | 840 ± | 510 ± | 0 | 13 mm | None |

* Excluding conduit web ** Top dimension

## NOTES ON PULL BOXES

1. Traffic pull box shall be provided with steel cover and special concrete footing. Steel cover shall have embossed non-skid pattern.
2. Steel reinforcing shall be as regularly used in the standard products of the respective manufacturer.
3. Top of pull boxes shall be flush with surrounding grade or top of adjacent curb, except that in unpaved areas where pull box is not immediately adjacent to and protected by a concrete foundation, pole or other protective construction, the box shall be placed with its top 30 mm above surrounding grade. Where practicable, pull boxes shown in the vicinity of curbs shall be placed adjacent to the back of curb, and pull boxes shown adjacent to standards shall be placed on side of foundation facing away from traffic, unless otherwise noted. When pull box is installed in sidewalk area, the depth of the pull box shall be adjusted so that the top of the pull box is flush with the sidewalk.
4. Pull box covers shall be marked as follows: "SERVICE" Service circuits between service point and service disconnect; "SPRINKLER-CONTROL" Sprinkler control circuits, 50 V or less; "CALTRANS" On all pull boxes, except pull boxes marked "SPRINKLER-CONTROL"; and "TELEPHONE" Telephone service.

   a) No. 3½ pull box.

      1) "SIGNAL" Traffic signal circuits with or without street or sign lighting circuits.

      2) "ST LIGHTING" Street or sign lighting circuits where voltage is under 600 V.

   b) No. 5, 6, 9 or 9A pull box.

      1) "TRAFFIC SIGNAL" Traffic signal circuits with or without street or sign lighting circuits.

      2) "STREET LIGHTING" Street or sign lighting circuits where voltage is under 600 V.

      3) "STREET LIGHTING-HIGH VOLTAGE" Street or sign lighting circuits where voltage is above 600 V.

      4) "IRRIGATION" Circuits to irrigation controller 120 V or more.

      5) "RAMP METER" Ramp meter circuits.

      6) "COUNT STATION" Count or speed monitor circuits.

      7) "COMMUNICATION" Communication circuits.

      8) "TOS COMMUNICATIONS" TOS communications line

      9) "TOS POWER" TOS power.

      10) "TOC POWER" Telephone demarcation cabinet power.

      11) "CCTV" Closed circuit television circuits.

      12) "TMS" Traffic monitoring station circuits.

      13) "CMS" Changeable message sign circuits.

      14) "HAR" Highway advisory radio circuits.

5. Bonding jumper for metal covers shall be 1 m long, minimum.
6. The nominal dimensions of the opening in which the cover sets shall be the same as the cover dimensions except the length and width dimensions shall be 3 mm greater.
7. Covers and boxes shall be interchangeable with California standard male and female gages. When interchanged with a standard male or female gage, the top surfaces shall be flush within 3 mm. Top outside edge of concrete covers and pull boxes shall have a 6 mm minimum radius.
8. Pull box shall not be installed within the boundaries of new or existing curb ramps.
9. Pull boxes for electroliers, post and signal standards shall be located ± 1.5 m from the station of the adjacent electroliers, post or signal standard. Pull boxes shall be placed adjacent to back of curb or edge of shoulder except where this is impractical, a box may be placed in another suitable protected and accessible location.

Caltrans Metric

| DIST | COUNTY | ROUTE | KILOMETER POST / TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

REGISTERED CIVIL ENGINEER

July 1, 2004
PLANS APPROVAL DATE

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To get to the Caltrans web site, go to: http://www.dot.ca.gov

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# ELECTRICAL SYSTEMS (PULL BOX DETAILS)

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

ES-8

2004 Std PLAN ES-8

Caltrans Metric

| DIST | COUNTY | ROUTE | KILOMETER POST TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

REGISTERED CIVIL ENGINEER

July 1, 2004
PLANS APPROVAL DATE

Greg K. Dewitt
C36345
Exp. 6-30-06
CIVIL
STATE OF CALIFORNIA

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# TYPICAL LANE CLOSURE

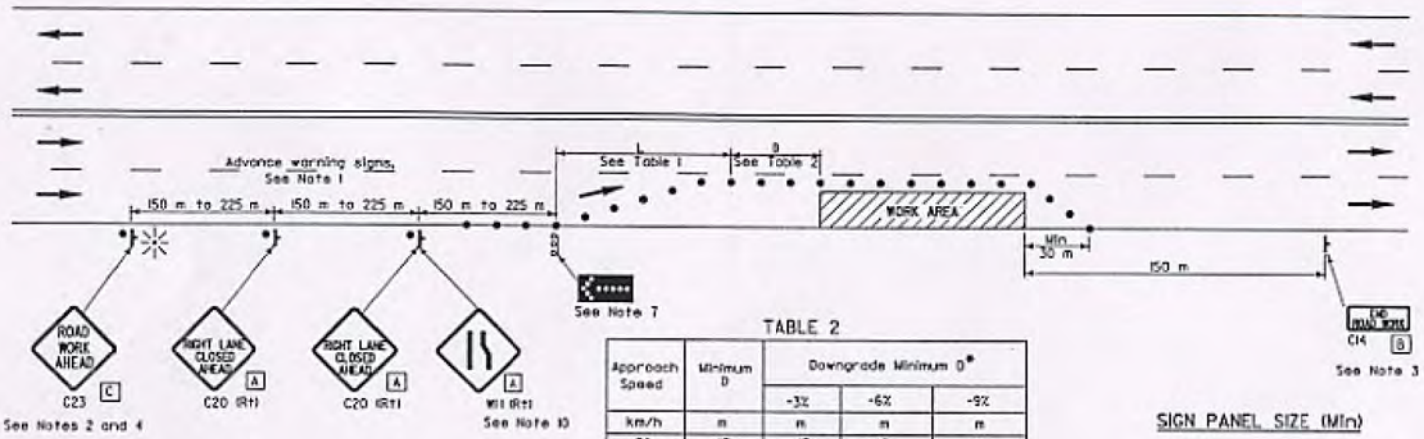


TABLE 2

| Approach Speed | Minimum D | Downgrade Minimum D* | | |
|---|---|---|---|---|
| | | -3% | -6% | -9% |
| km/h | m | m | m | m |
| 30 | 45 | 45 | 45 | 45 |
| 40 | 45 | 50 | 50 | 53 |
| 50 | 45 | 66 | 70 | 74 |
| 60 | 45 | 87 | 92 | 97 |
| 70 | 65 | 110 | 116 | 124 |
| 80 | 85 | 135 | 144 | 154 |

* Use on sustained downgrade steeper than or equal to grades shown and longer than 1.6 km.

SIGN PANEL SIZE (Min)

- A 914 mm x 914 mm
- B 914 mm x 457 mm
- C 762 mm x 762 mm

LEGEND

- Traffic Cone
- Portable Sign
- Direction of Travel
- Flashing Arrow Sign (FAS)
- FAS Support or Trailer
- Portable Flashing Beacon

S

e approach speeds are low, advance warning s may be placed at 90 m spacing and placed er in urban areas.

advance warning sign shall be equipped with east two flags for daytime closure. Each flag be at least 400 mm x 400 mm in size and shall range or fluorescent red-orange in color. ing beacons shall be placed at the locations ated for lane closure during hours of darkness.

"END ROAD WORK" sign, as appropriate, be placed at the end of the lane closure s the end of work area is obvious, or ends n a larger project's limits.

e C23 sign would follow within 600 m of ctionary C23 or C11 "ROAD WORK NEXT MILES", use a C20 sign for the first nce warning sign.

ones used for lane closures during the s of darkness shall be fitted with retroreflective s for sleeves as specified in the specifications.

6. Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.

7. Flashing arrow sign shall be either Type I or Type II.

8. The maximum spacing between cones along a tangent shall be 15 m and along a taper shall be approximately as shown in Table L

9. For approach speeds over 80 km/h, use the "Traffic Control System for Lane Closure On Freeways And Expressways" plan for lane closure details and requirements.

10. When specified in the special provisions, a W11 "LANE ENDS" symbol sign is to be used in place of the C20 "RIGHT LANE CLOSED AHEAD" sign.

TABLE 1

| Approach Speed | * Minimum L | ** Max spacing of cones along taper |
|---|---|---|
| km/h | m | m |
| 30 | 38 | 6 |
| 40 | 38 | 8 |
| 50 | 98 | 10 |
| 60 | 98 | 12 |
| 70 | 183 | 14 |
| 80 | 183 | 15 |
| Over 80 | See Note 9 | |

* Use L for lane widths less than or equal to 3.6 m.

** See Note 8

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON MULTILANE CONVENTIONAL HIGHWAYS

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

T11

LEGEND

- Traffic Cone
- Portable Sign
- Direction of Travel
- Flashing Arrow Sign (FAS)
- FAS Support or Trailer
- Portable Flashing Beacon

TABLE 1

| Approach Speed | * Minimum L | ** Max spacing of cones along taper |
|---|---|---|
| km/h | m | m |
| 30 | 38 | 6 |
| 40 | 38 | 8 |
| 50 | 98 | 10 |
| 60 | 98 | 12 |
| 70 | 183 | 14 |
| 80 | 183 | 15 |
| Over 80 | See Note 11 | |

* Use L for lane widths less than or equal to 3.6 m.

** See Note 10

TABLE 2

| Approach Speed | Minimum D | Downgrade Minimum D* | | |
|---|---|---|---|---|
| | | -3% | -6% | -9% |
| km/h | m | m | m | m |
| 30 | 45 | 45 | 45 | 45 |
| 40 | 45 | 50 | 50 | 53 |
| 50 | 45 | 66 | 70 | 74 |
| 60 | 45 | 87 | 92 | 97 |
| 70 | 65 | 110 | 116 | 124 |
| 80 | 85 | 136 | 144 | 154 |

* Use an sustained downgrade steeper than or equal to grades shown and longer than 1.6 km.

Caltrans Metric

| DIST | COUNTY | ROUTE | KILOMETER POST TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

July 1, 2004
PLANS APPROVAL DATE

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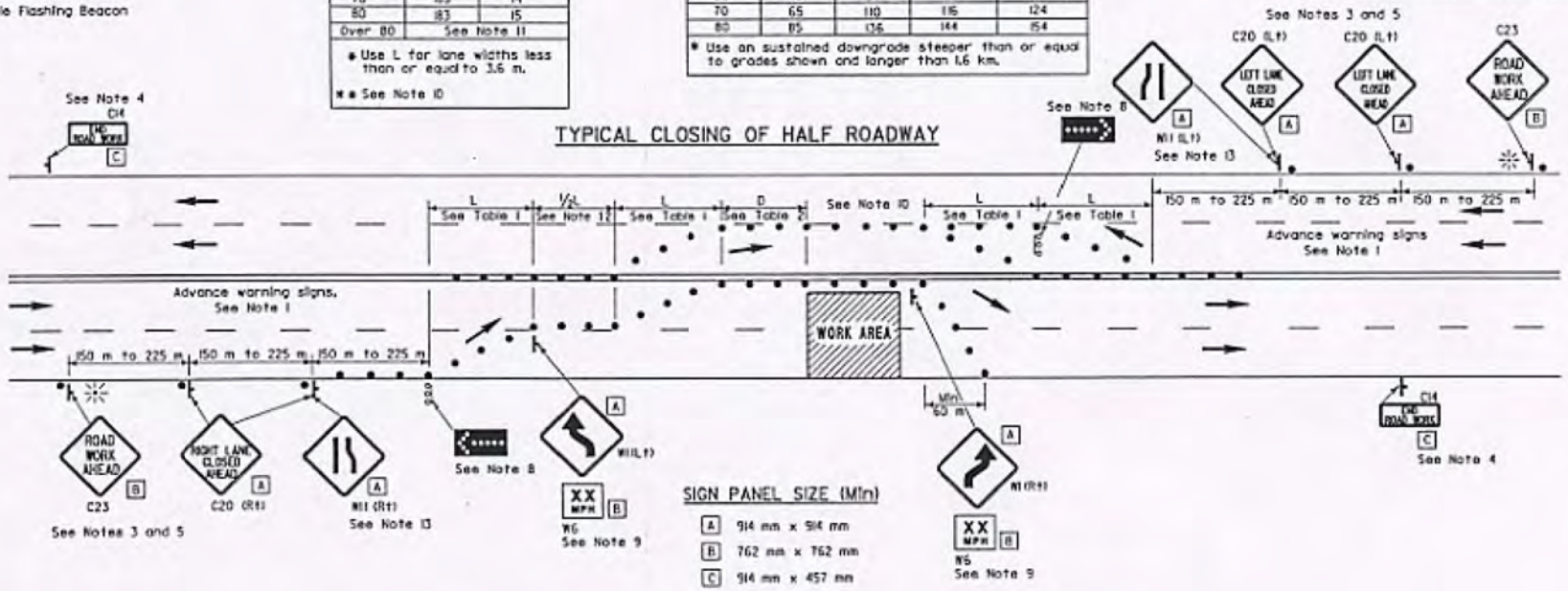
TYPICAL CLOSING OF HALF ROADWAY




SIGN PANEL SIZE (Min)

- A 914 mm x 914 mm
- B 762 mm x 762 mm
- C 914 mm x 457 mm

...s

...e Approach speeds are low, advance ...ing signs may be placed at 90 m spacing ...placed closer in urban areas.

...east one person shall be assigned to provide ...time maintenance of traffic control devices ...lane closure unless, otherwise directed by ...Engineer.

...advance warning sign in each direction ...travel shall be equipped with at least two ...s for daytime closure. Each flag shall be at ...1 400 mm x 400 mm in size and shall be ...nge or fluorescent red-orange in color. ...shing beacons shall be placed at the locations ...cated for lane closure during hours of ...kness.

...4 "END ROAD WORK" sign, as appropriate, ...l be placed at the end of the lane closure ...ss the end of work area is obvious, or ends ...in a longer project's limits.

5. If the C23 sign would follow within 600 m of a stationary C23 or C11 "ROAD WORK NEXT _____ MILES", use a C20 sign for the first advance warning sign.

6. All cones used for lane closures during the hours of darkness shall be fitted with retroreflective bands (or sleeves) as specified in the specifications.

7. Portable delineators, placed at one-half the spacing indicated for traffic cones, may be used instead of cones for daytime closures only.

8. Flashing arrow signs shall be either Type I or Type II.

9. Advisory speed will be determined by the Engineer. The W6 Sign will not be required when advisory speed is more than the posted or maximum speed limit.

10. The maximum spacing between cones along a tangent shall be 15 m and along a taper shall be approximately as shown in Table 1.

11. For approach speeds over 80 km/h, use the "Traffic Control System for Lane Closure On Freeways And Expressways" plan for lane closure details and requirements.

12. Unless otherwise specified in the special provisions, the ( 1/2 L) shown between the two (L) lane closure tapers shall be used.

13. When specified in the special provisions, a W11 "Lane Ends" symbol sign is to be used in place of the C20 "RIGHT (LEFT) LANE CLOSED AHEAD" sign.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON MULTILANE CONVENTIONAL HIGHWAYS

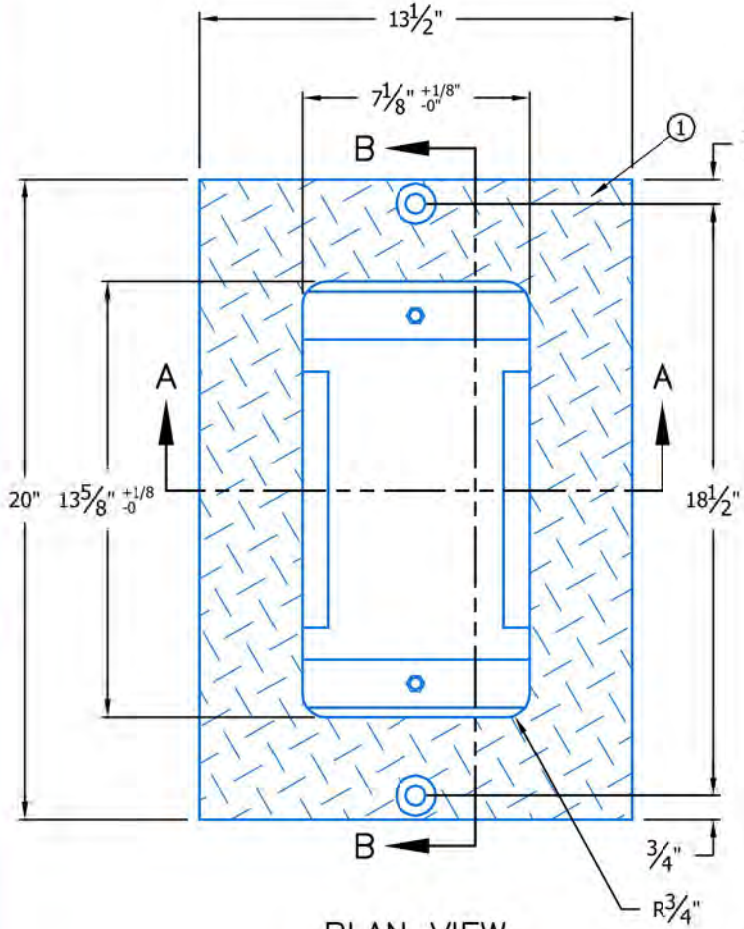
NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

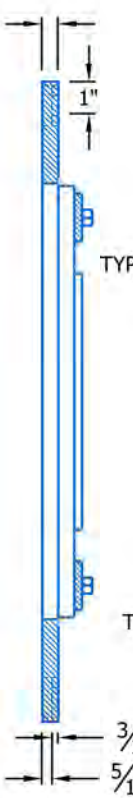
T12

2004 Std PLAN T12

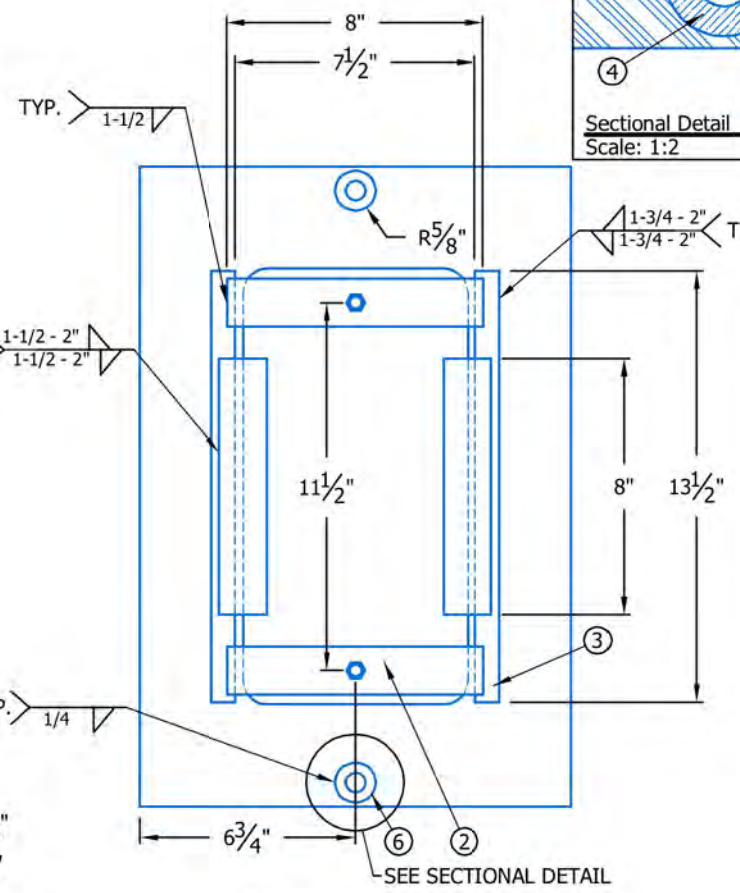
# APPENDIX D



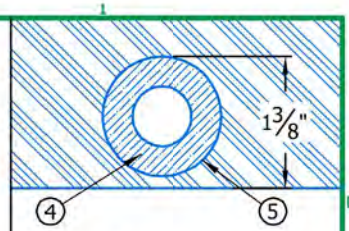

PLAN VIEW




SECTION B–B




BOTTOM VIEW




Sectional Detail
Scale: 1:2


SECTION A–A

NOTES: UNLESS OTHERWISE SPECIFIED.

1. MATERIAL: ½" DIAMOND CHECKER PLATE.
2. MATERIAL: ¼" x 1½" STEEL FLAT STOCK.
3. MATERIAL: ¾" x ½" STEEL FLAT STOCK.
4. MATERIAL: 3/16" STEEL FLAT STOCK.
5. 3/16" WASHER TO BE WELDED PER ASTM A-706
6. SURFACE AROUND WELD TO BE FLAT.

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801 S. Pine St
Madera, CA 93637

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES TOLERANCE: .XXX = +/- .0005 .XX = +/- .005 .X = +/- .050 FRACTION = +/- 1/16 ANGLE = +/- 1°

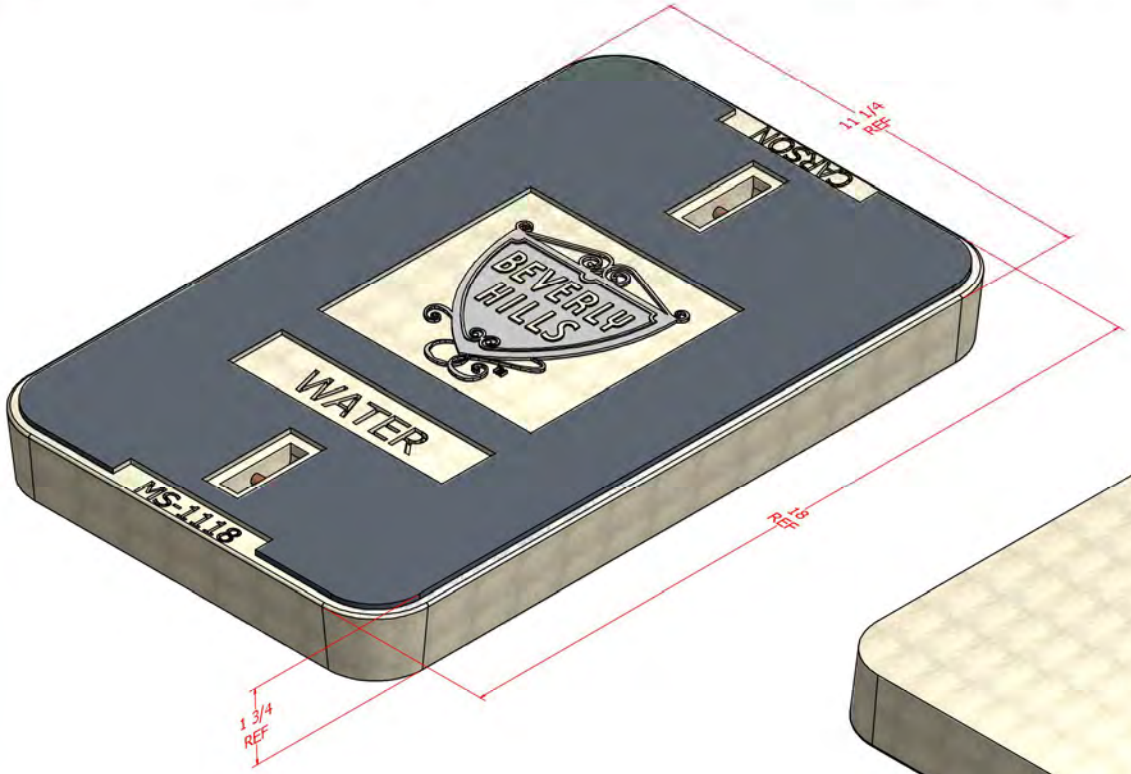
| | | |
|---|---|---|
| DRAWN | T. BARKER | 07/06/09 |
| CHECKED | A. LOUCKS | |
| QA | | |
| MFG | | |
| APPROVED | | |

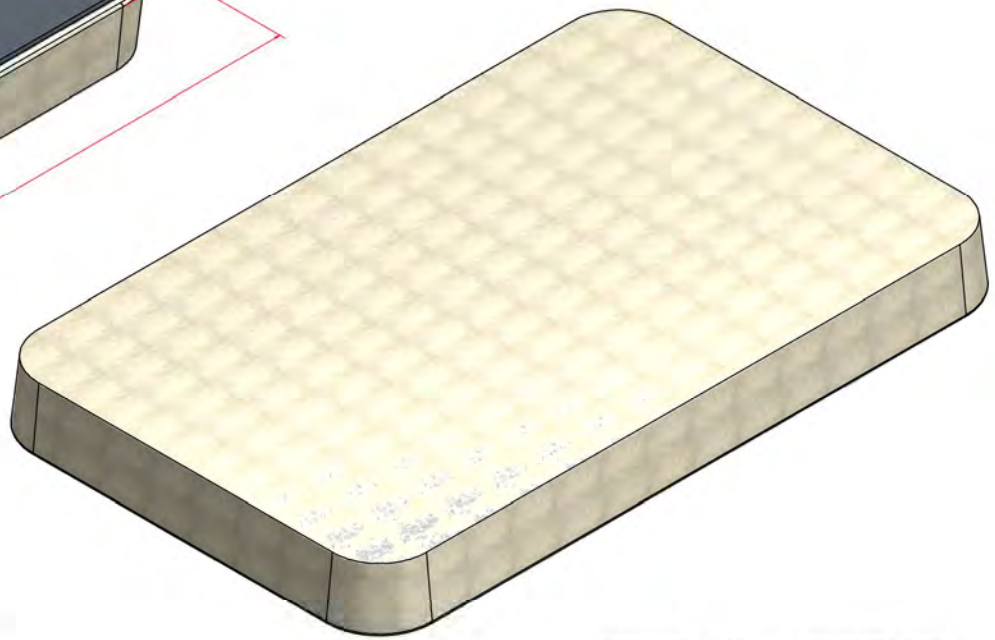
TITLE: B1017-51E w/ 7x13 POLYMER CONCRETE READER

| SIZE | DWG NO | REV |
|---|---|---|
| A | 1017-E-STEELCOVER-E | E |

SCALE: 2" = 1'-0" SHEET 1 OF 1

| REVISION | | | | |
|---|---|---|---|---|
| REV | DESCRIPTION | BY | DATE | APPROVED |
| -A- | ADDED NOTES 1 &2 | JV | APR 14, 09 | NTD |



MATERIAL: POLYMER CONCRETE GRAY

## *CUSTOMER FORMAT DRAWING*

ESTIMATED PART WEIGHT: 25 lbs.

NOTES:

1. COVER SHALL BE CONSTRUCTED OF REINFORCED POLYMER CONCRETE WITH A COMPRESSIVE STRENGTH GREATER THAN 11,000 PSI. TWO CONTINUOUS SHEETS OF WOVEN AND STICHED BOROSILICATE GLASS CLOTH SHALL REINFORCE THE UPPER, AND LOWER CROSS SECTIONS.
2. COEFFICIENT OF FRICTION SHALL BE GREATER THAN 0.5 (ASTM C-1028-96).

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE IN INCHES
TOLERANCE:
.XXX = +/- .0005
.XX = +/- .005
.X = +/- .050
FRACTION = +/- 1/8
ANGLE = +/- 1°

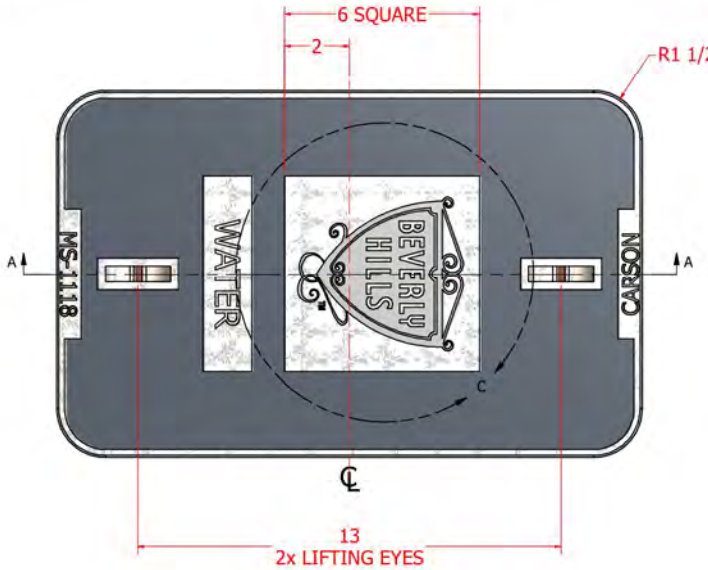
Oldcastle Precast
CARSON

| | | |
|---|---|---|
| DRAWN | jvelazquez | 2/26/2009 |
| CHECKED | | |
| QA | | |
| MFG | | |
| APPROVED | JC Pickrell | |

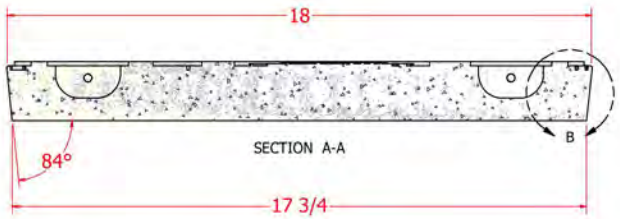
TITLE: 1118 PC FLUSH COVER BEVERLY HILLS WATER 2x LIFTING EYES 0x BOLT HOLES

SIZE: D | DWG NO: 11185013 | REV: -A-

SCALE | SHEET 1 OF 2

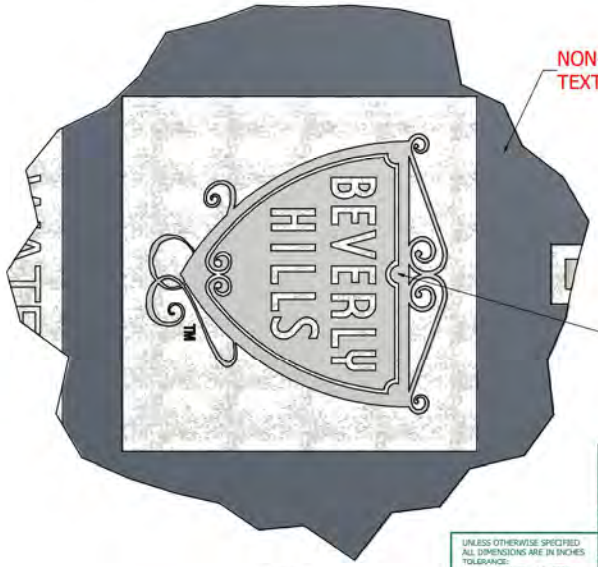







SECTION A-A


DETAIL B




DETAIL C

*CUSTOMER FORMAT DRAWING*

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
TOLERANCE:
XXX = +/- .0005
XX = +/- .005
X = +/- .050
FRACTION = +/- 1/8
ANGLE = +/- 1°

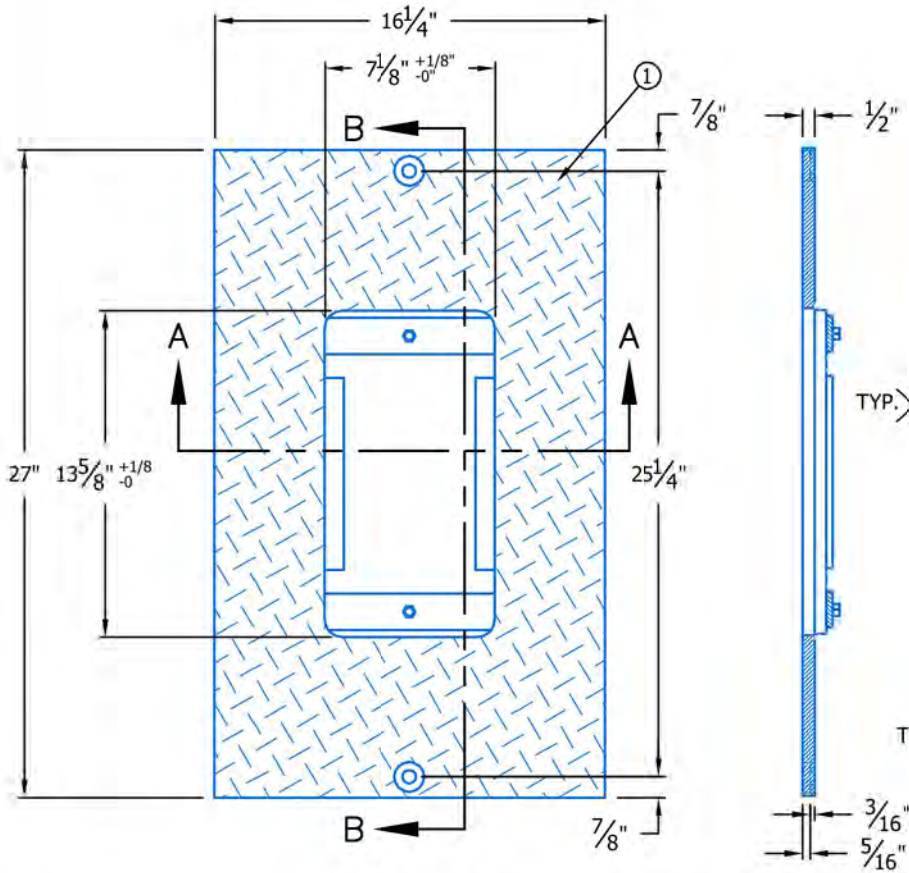
| | | |
|---|---|---|
| DRAWN | jvelazquez | 2/26/2009 |
| CHECKED | | |
| QA | | |
| MFG | | |
| APPROVED | JK Pickrell | |

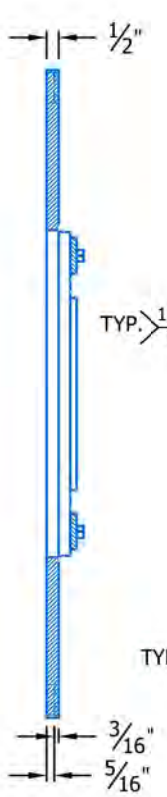
Oldcastle Precast
CARSON

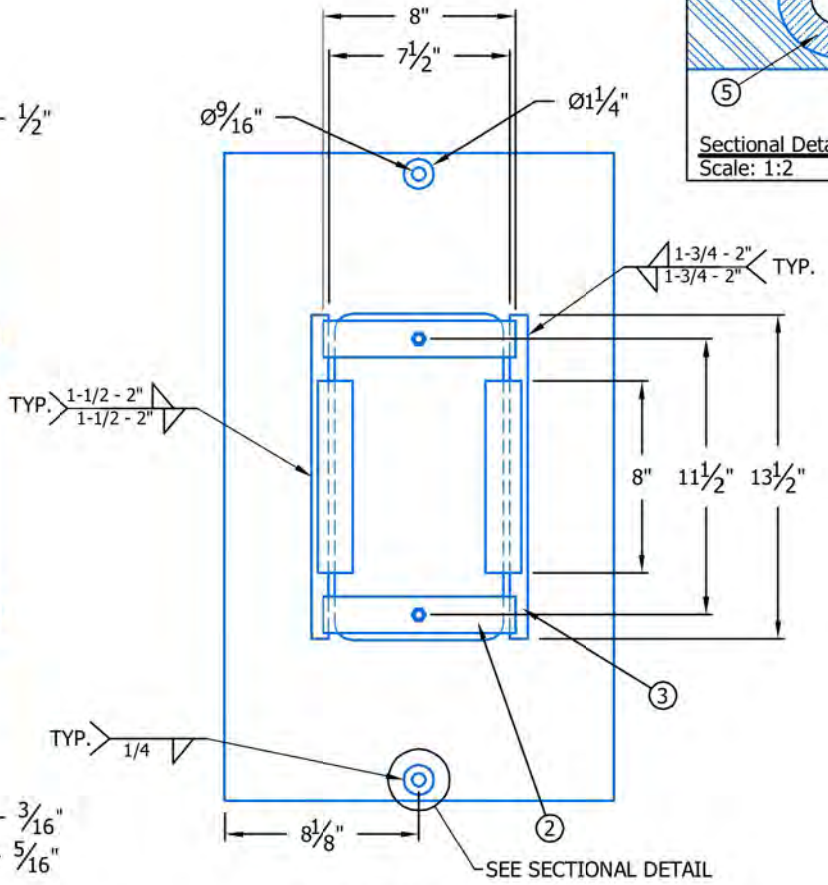
TITLE: 1118 PC FLUSH COVER BEVERLY HILLS WATER 2x LIFTING EYES 0x BOLT HOLES

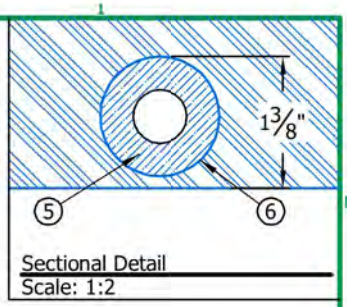
SIZE: D | DWG NO: 11185013 | REV: -A-

SCALE | SHEET 2 OF 2





NOTES: UNLESS OTHERWISE SPECIFIED.

1. MATERIAL: ½" DIAMOND CHECKER PLATE.
2. MATERIAL: ¼" x 1½" STEEL FLAT STOCK.
3. MATERIAL: ¾" x ½" STEEL FLAT STOCK.
4. MATERIAL: ⅜"-16 STEEL NUT.
5. 3/16" THICK WASHER TO BE WELDED PER ASTM A-706
6. SURFACE AROUND WELD TO BE FLAT.

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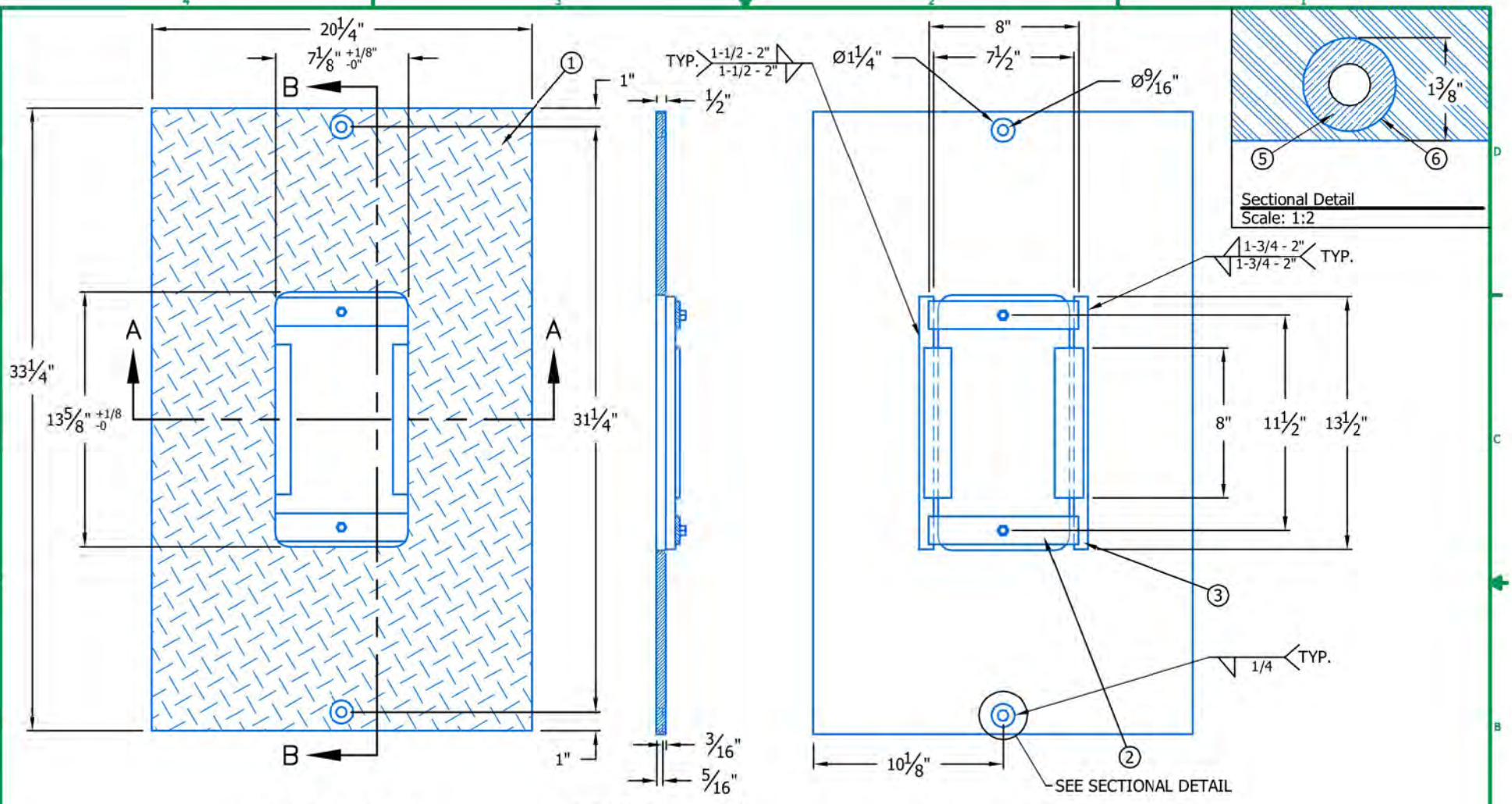
TOLERANCE:
.XXX = +/- .0005
.XX = +/- .005
.X = +/- .050
FRACTION = +/- 1/16
ANGLE = +/- 1°

| | | |
|---|---|---|
| DRAWN | T. BARKER | 07/29/09 |
| CHECKED | A. LOUCKS | |
| QA | | |
| MFG | | |
| APPROVED | | |

TITLE: B1324-51E w/ 7X13 POLYMER CONCRETE READER - 2001341

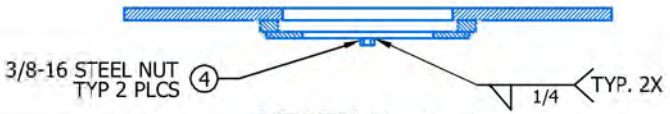
| SIZE | DWG NO | REV |
|---|---|---|
| A | 1324-E-STEELCOVER-A | A |

SCALE 1-1/2" = 1'-0" SHEET 1 OF 1




PLAN VIEW

SECTION B–B




SECTION A–A

NOTES: UNLESS OTHERWISE SPECIFIED.

1. MATERIAL: ½" DIAMOND CHECKER PLATE.
2. MATERIAL: ¼" x 1½" STEEL FLAT STOCK.
3. MATERIAL: ¾" x ½" STEEL FLAT STOCK.
4. MATERIAL: ⅜"-16 STEEL NUT.
5. 3/16" THICK WASHER TO BE WELDED PER ASTM A-706
6. SURFACE AROUND WELD TO BE FLAT.

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TOLERANCE:
.XXX = +/- .0005
.XX = +/- .005
.X = +/- .050
FRACTION = +/- 1/16
ANGLE = +/- 1°

| | | |
|---|---|---|
| DRAWN | T. BARKER | 07/29/09 |
| CHECKED | A. LOUCKS | |
| QA | | |
| MFG | | |
| APPROVED | | |

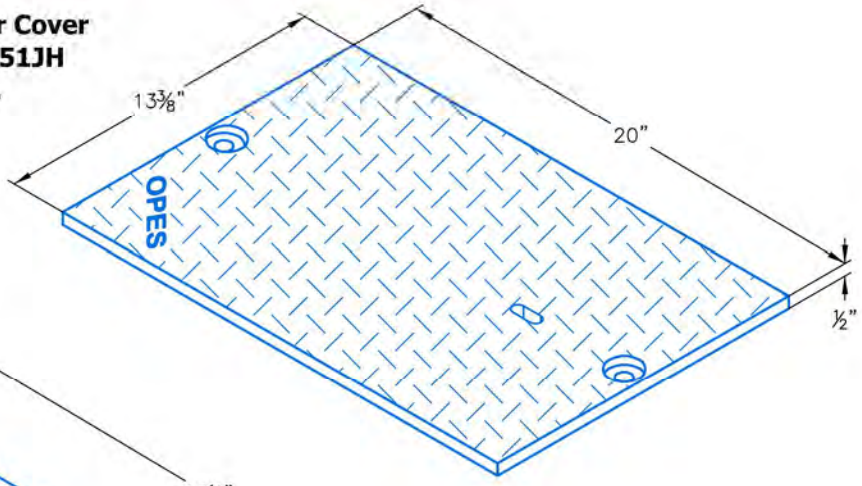
TITLE: B1730-51E w/ 7x13 PLOYMER CONCRETE READER - 2002036

| SIZE | DWG NO | REV |
|---|---|---|
| A | 1730-E-STEELCOVER-A | A |

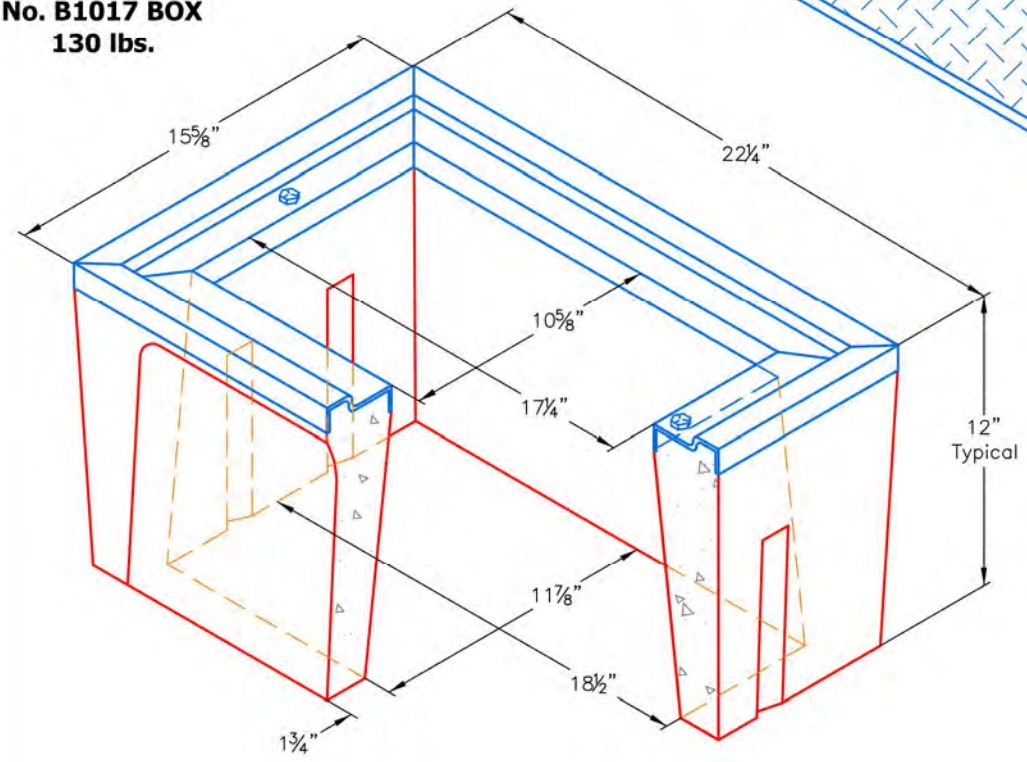
SCALE 1-1/2" = 1'-0" SHEET 1 OF 1

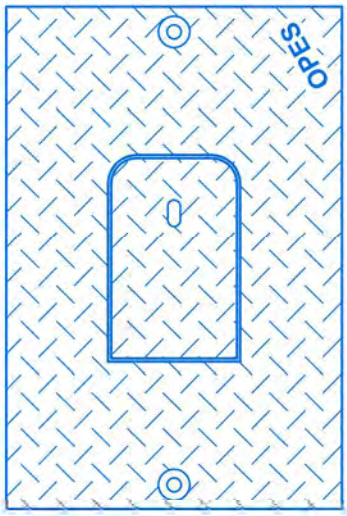
**Traffic Box**
**Caltrans No. 3-1/2T State Specs**

**Steel Checker Cover**
**No. B1017-51JH**
**44 lbs.**




**Traffic Box**
**No. B1017 BOX**
**130 lbs.**




**B1017-51GH**

A high density reinforced concrete box with non-settling shoulders positioned to maintain grade and facilitate back filling. Hex-Head Bolts are included with Box. Approximate dimensions and weight shown.

| Oldcastle Ordering Code | Item | Approx. Shipping Weight | Description |
|---|---|---|---|
| B1017BOX | BOX | 130 lbs. | B1017 Utility Box (10⅝" x 17¼") H/20 Loading w/ Bolts – 20 per pallet |
| B1017-51JH | COVER | 44 lbs. | Steel Checker Plate, H/20, Bolt Down |
| B1017-51GH | COVER | 46 lbs. | Steel Checker Plate, H/20 with 5" x 8" Reading Lid |
| B1017X12 | EXTENSION | 129 lbs. | 12" Reinforced Concrete H/20 Loading – 20 per pallet |
| B9SL | SLAB | 32 lbs. | Reinforced Concrete (13¾" x 19¾") |
| Galvanizing available on all steel covers | | | |


Oldcastle Precast®
Enclosure Solutions
Phone: (800) 486-7070 Fax: (800) 486-6804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**B1017 BOX**

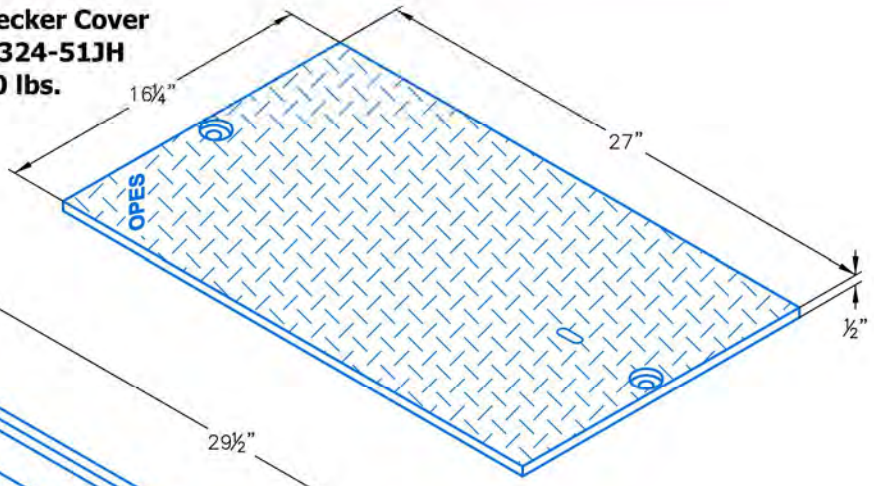
FILE NAME: B1017_ISO
ISSUE DATE: January, 2011
www.oldcastleprecast.com

**B1017 BOX H/20 LOADING**
**10-5/8" x 17-1/4"**

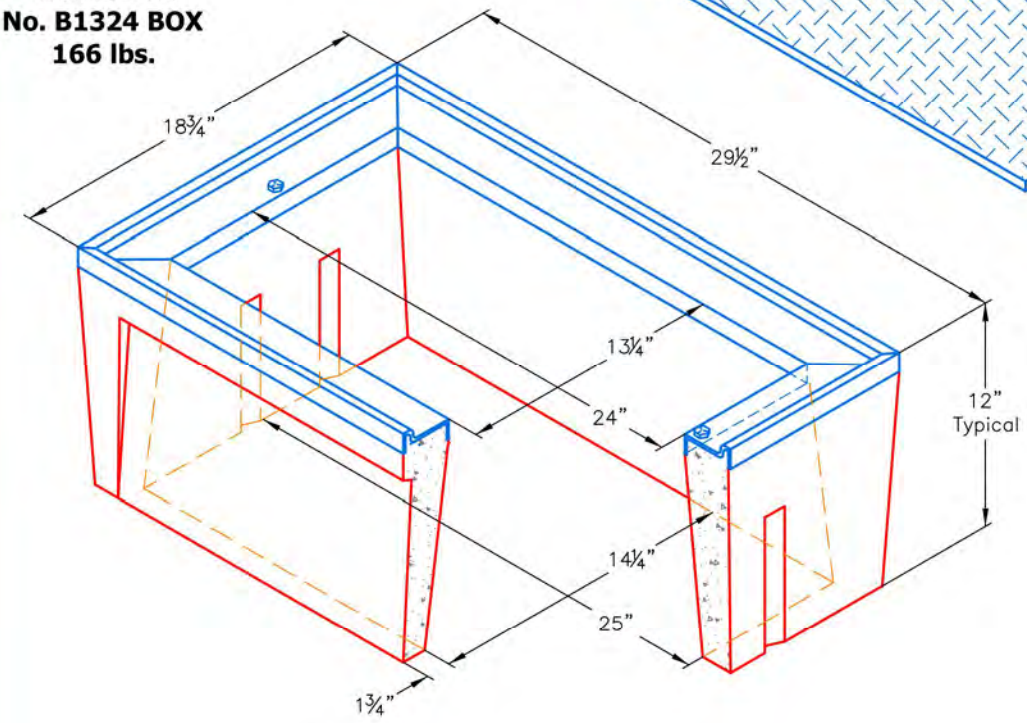
Christy

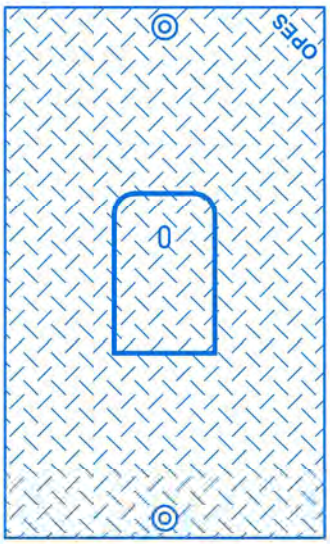
**Traffic Box**
**Caltrans No. 5T State Specs**

**Steel Checker Cover**
**No. B1324-51JH**
**70 lbs.**




**Traffic Box**
**No. B1324 BOX**
**166 lbs.**




**B1324-51GH**

A high density reinforced concrete box with non-settling shoulders positioned to maintain grade and facilitate back filling. Hex-Head Bolts are included with Box. Approximate dimensions and weight shown.

| Oldcastle Ordering Code | Item | Approx. Shipping Weight | Description |
|---|---|---|---|
| B1324BOX | BOX | 166 lbs. | B1324 Utility Box (13¼" x 24") H/20 Loading w/ Bolts – 16 per pallet |
| B1324-51JH | COVER | 70 lbs. | Steel Checker Plate, H/20, Bolt Down |
| B1324-51GH | COVER | 72 lbs. | Steel Checker Plate, H/20 with 5" x 8" Reading Lid |
| B1324X12 | EXTENSION | 163 lbs. | 12" Reinforced Concrete H/20 Loading – 16 per pallet |
| B30SL | SLAB | 52 lbs. | Reinforced Concrete (16" x 28") |
| Galvanizing available on all steel covers | | | |


Oldcastle Precast®
Enclosure Solutions
Phone: (800) 486-7070 Fax: (800) 486-6804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**B1324 BOX**

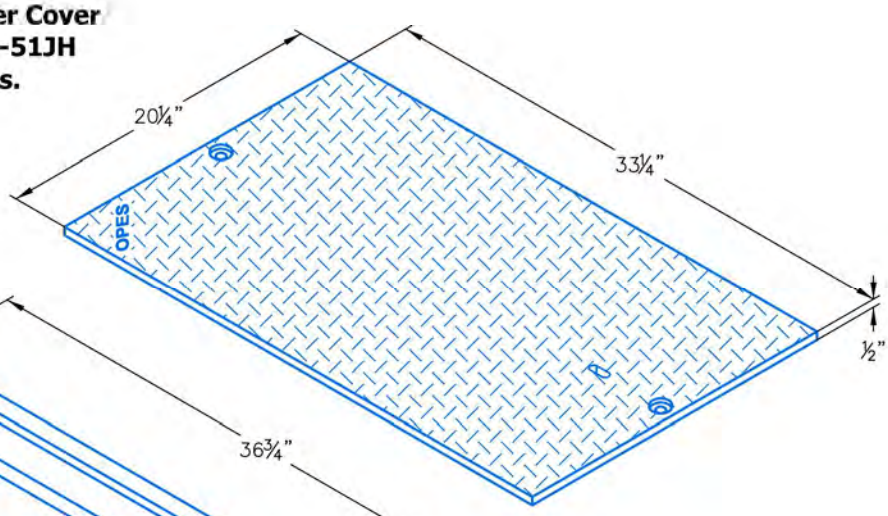
FILE NAME: B1324_ISO
ISSUE DATE: January, 2011
www.oldcastleprecast.com

**B1324 BOX H/20 LOADING**
**13-1/4" x 24"**

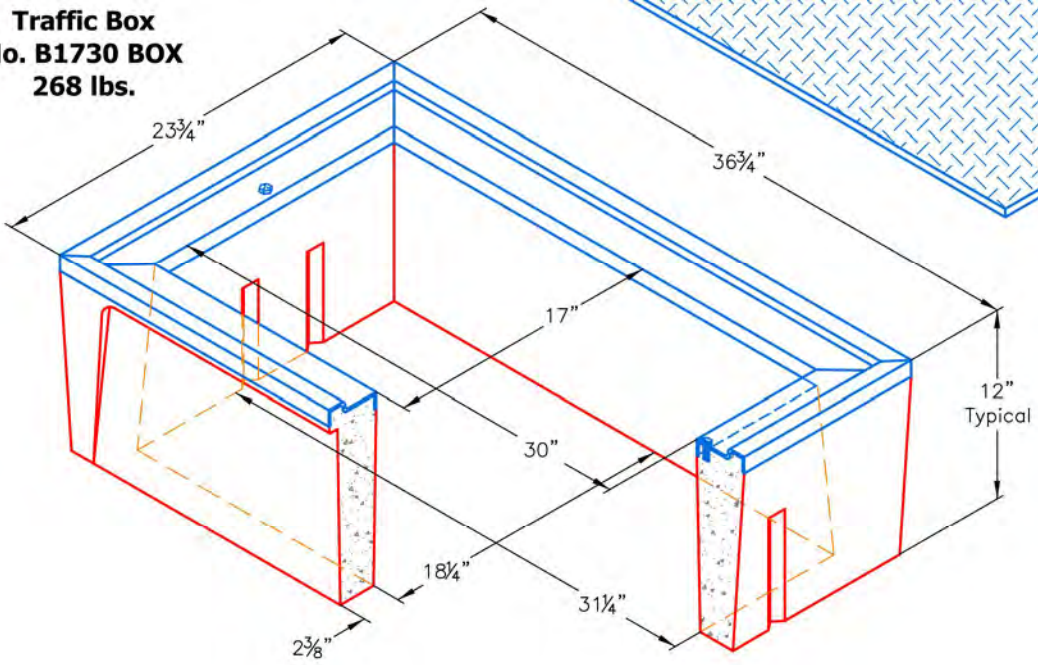
Christy

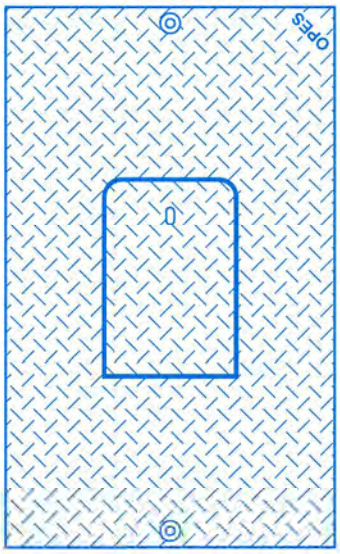
**Traffic Box**
**Caltrans No. 6T State Specs**

**Steel Checker Cover**
**No. B1730-51JH**
**111 lbs.**




**Traffic Box**
**No. B1730 BOX**
**268 lbs.**




**B1730-51GH**

A high density reinforced concrete box with non-settling shoulders positioned to maintain grade and facilitate back filling. Head-Head Bolts are included with Box. Approximate dimensions and weight shown.

| Oldcastle Ordering Code | Item | Approx. Shipping Weight | Description |
|---|---|---|---|
| B1730BOX | BOX | 268 lbs. | B1730 Utility Box (17" x 30") H/20 Loading w/ Bolts – 6 per pallet |
| B1730-51JH | COVER | 111 lbs. | Steel Checker Plate, H/20, Bolt Down |
| B1730-51GH | COVER | 112 lbs. | Steel Checker Plate, H/20 with 8" x 12" Reading Lid |
| B1730X12 | EXTENSION | 250 lbs. | 12" Reinforced Concrete H/20 Loading – 6 per pallet |
| B36SL | SLAB | 108 lbs. | Reinforced Concrete (20" x 34") |
| Galvanizing available on all steel covers | | | |

Oldcastle Precast®
Enclosure Solutions
Phone: (800) 486-7070 Fax: (800) 486-6804
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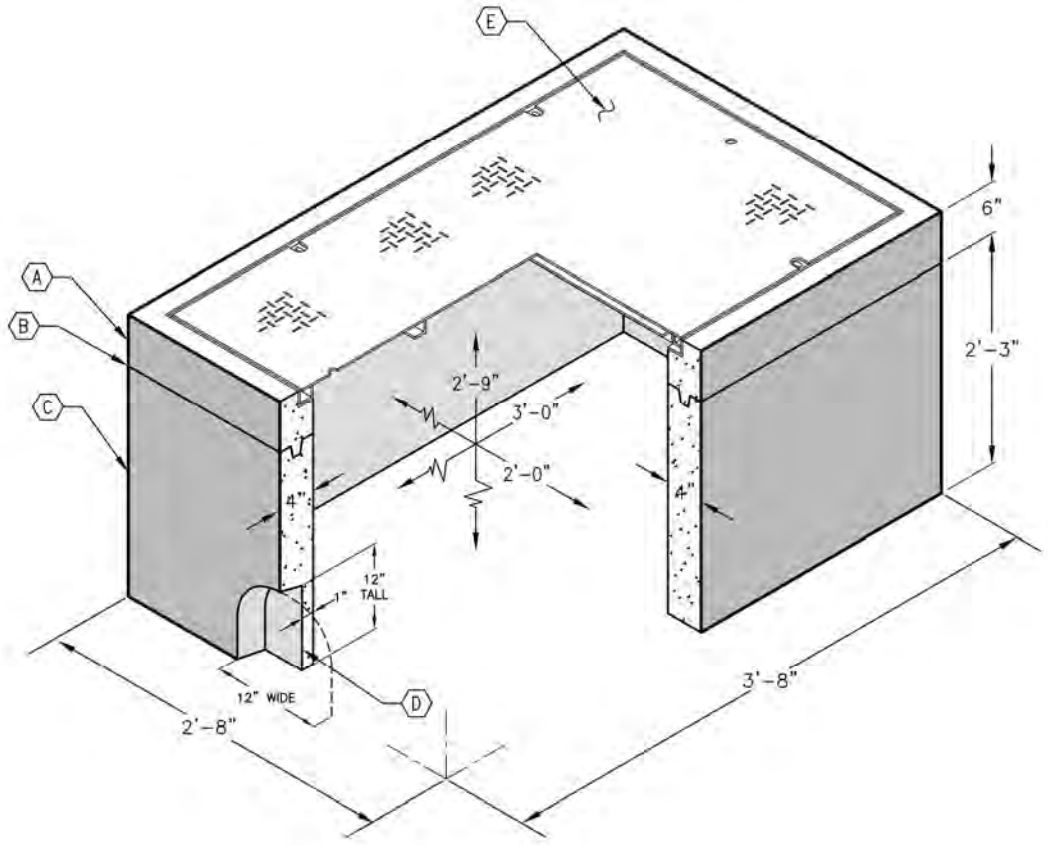
**B1730 BOX**

FILE NAME: B1730_ISO
ISSUE DATE: January, 2011
www.oldcastleprecast.com

**B1730 BOX H/20 LOADING**
**17" x 30"**

Christy




■ ILLUSTRATION IS TYPICAL ONLY OF GENERAL SERIES CONFIGURATION. FOR SPECIFIC CONFIGURATION, CALL JENSEN PRECAST.

MINIMUM EXCAVATION SIZE:
3'-2" x 4'-2" x DEPTH REQUIRED.

Ⓐ 6" TOP SECTION WT.= 200 Lbs.

Ⓑ 6" OR 12" EXTENSION SECTIONS AVALIABLE

Ⓒ BOTTOM SECTION WT.= 1,200 Lbs.

Ⓓ 10" WIDE X 10" TALL PIPE KNOCKOUT ON EACH END WALL, CUSTOM SIZES AVALIABLE UPON REQUEST.

Ⓔ FOR COVERS: SEE COVER AND NECKING SECTION.

■ DESIGNED FOR PEDESTRIAN OR LIGHT TRAFFIC LOADING.

■ PLEASE CALL WITH DEPTH REQUIREMENTS, OTHER SIZES ARE AVALIABLE THAN WHAT IS SHOWN.

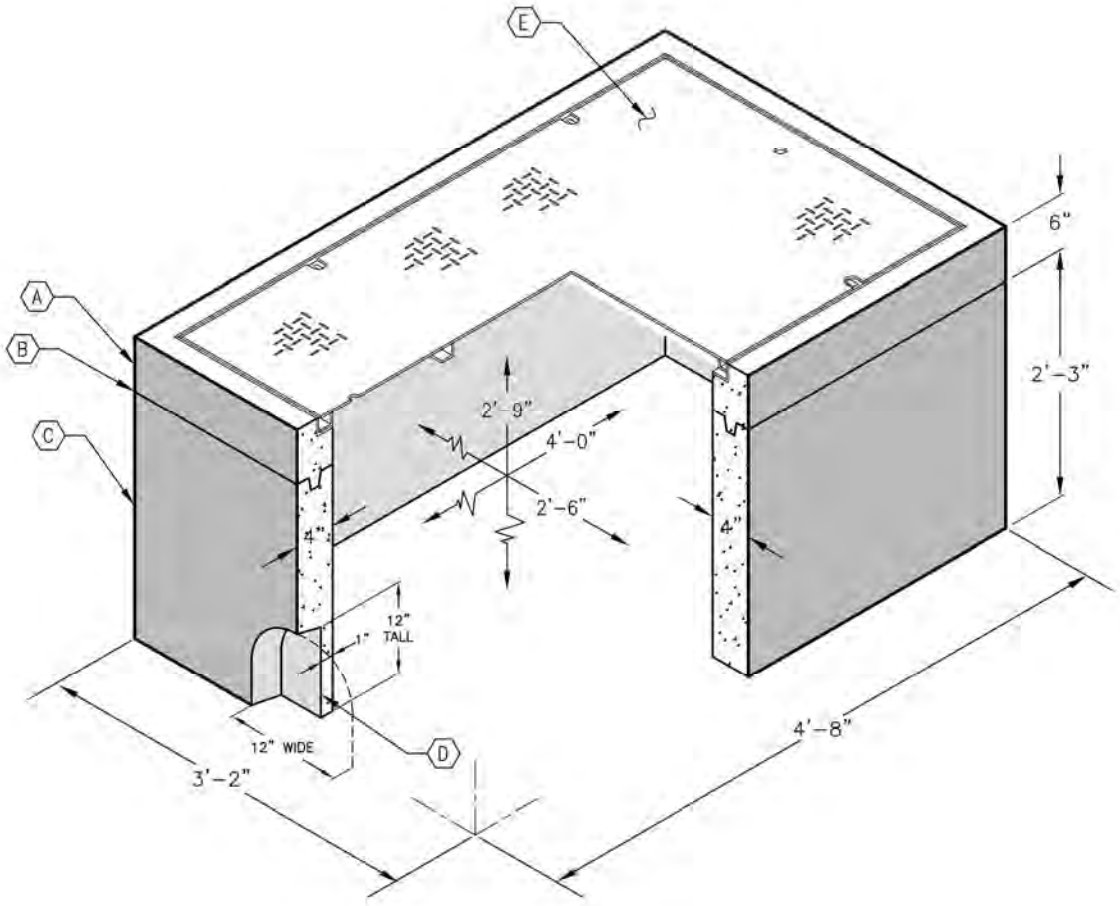
**2'-0" x 3'-0" VARIABLE DEPTH FLAT WALL WATER / GAS VAULT**

ORIG DWG DATE: 08-01-04

REV DWG DATE:

JENSEN PRECAST

**W-2436 SERIES**




■ ILLUSTRATION IS TYPICAL ONLY OF GENERAL SERIES CONFIGURATION: FOR SPECIFIC CONFIGURATION, CALL JENSEN PRECAST.

MINIMUM EXCAVATION SIZE:
3'-8" x 5'-2" x DEPTH REQUIRED.

Ⓐ 6" TOP SECTION WT.= 230 Lbs.

Ⓑ 6" OR 12" EXTENSION SECTIONS AVALIABLE.

Ⓒ BOTTOM SECTION WT.= 1,674 Lbs.

Ⓓ 10" WIDE X 10" TALL PIPE KNOCKOUT ON EACH END WALL, CUSTOM SIZES AVALIABLE UPON REQUEST.

Ⓔ FOR COVERS: SEE COVER AND NECKING SECTION.

■ DESIGNED FOR PEDESTRIAN OR LIGHT TRAFFIC LOADING.

■ PLEASE CALL WITH DEPTH REQUIREMENTS, OTHER SIZES ARE AVALIABLE THAN WHAT IS SHOWN.

**2'-6" x 4'-0" VARIABLE DEPTH FLAT WALL WATER / GAS VAULT**

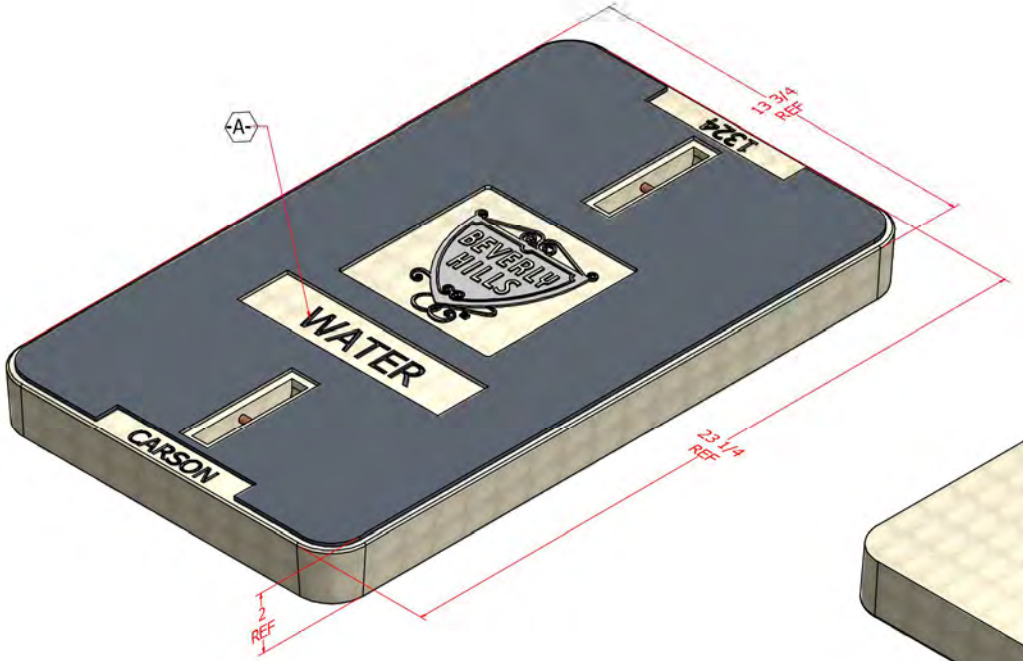
ORIG. DWG. DATE: 08-01-04

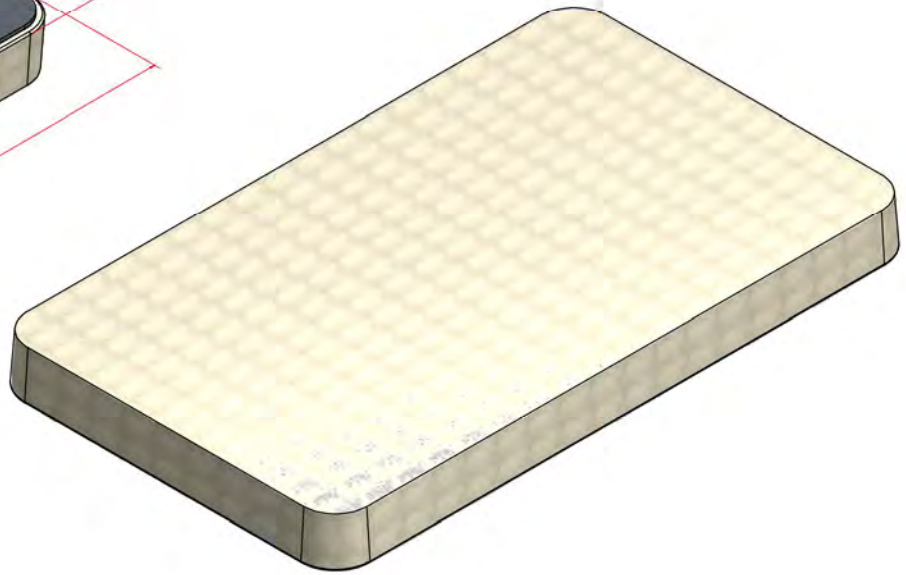
REV. DWG. DATE:

JENSEN PRECAST

**W-3048 SERIES**

| REVISIONS | | | | |
|---|---|---|---|---|
| REV | DESCRIPTION | BY | DATE | APPROVED |
| -A- | MARKING "WATER" WAS "WATER METER" | JV | MAR 02, 09 | NTD |
| -B- | ADDED NOTES 1 & 2 | JV | APR 14, 09 | NTD |



*CUSTOMER FORMAT DRAWING*

ESTIMATED PART WEIGHT: 44 lbs.

-B- NOTES:

1. COVER SHALL BE CONSTRUCTED OF REINFORCED POLYMER CONCRETE WITH A COMPRESSIVE STRENGTH GREATER THAN 11,000 PSI. TWO CONTINUOUS SHEETS OF WOVEN AND STICHED BOROSILICATE GLASS CLOTH SHALL REINFORCE THE UPPER, AND LOWER CROSS SECTIONS.
2. COEFFICIENT OF FRICTION SHALL BE GREATER THAN 0.5 (ASTM C-1028-96).

MATERIAL: POLYMER CONCRETE GRAY

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES
TOLERANCE:
.XXX = +/- .0005
.XX = +/- .005
.X = +/- .050
FRACTION = +/- 1/8
ANGLE = +/- 1°

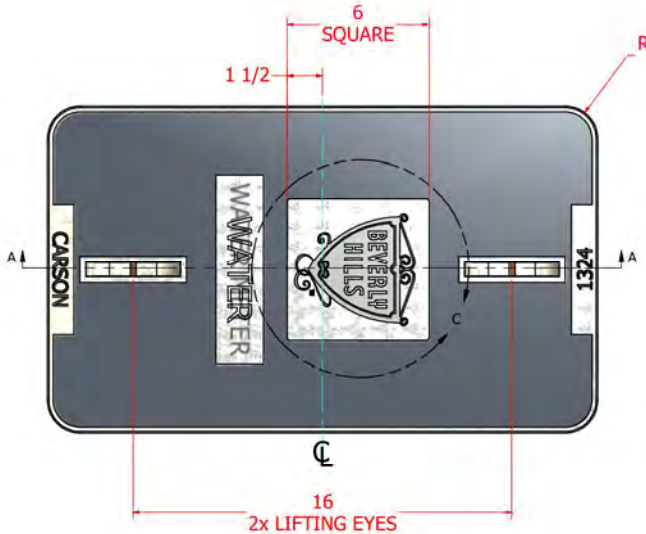
| | | |
|---|---|---|
| DRAWN | jvelazquez | 2/19/2009 |
| CHECKED | | |
| QA | | |
| MFG | | |
| APPROVED | JK Pickrell | 2/20/2009 |

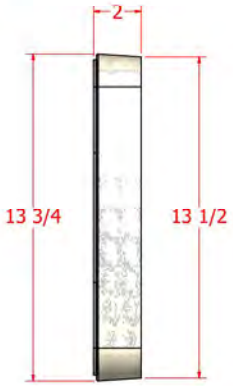
Oldcastle Precast CARSON

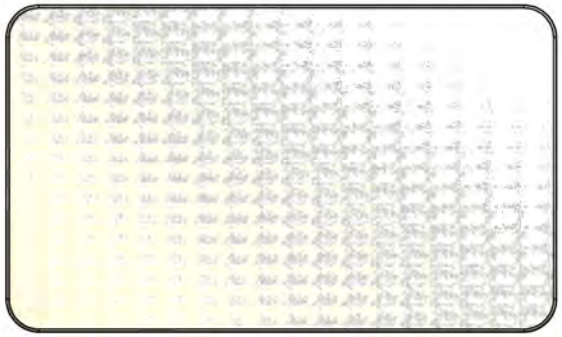
TITLE: 1324 BC FLUSH COVER PC BEVERLY HILLS WATER 2x LIFTING EYES 0 BOLT HOLES

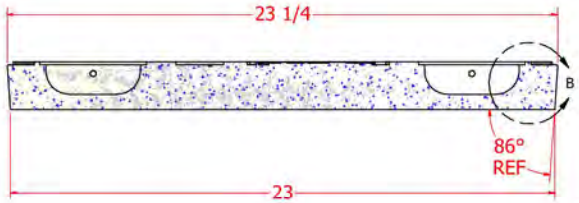
SIZE: D | DWG NO: 13245067 | REV: -B-

SCALE | SHEET 1 OF 2



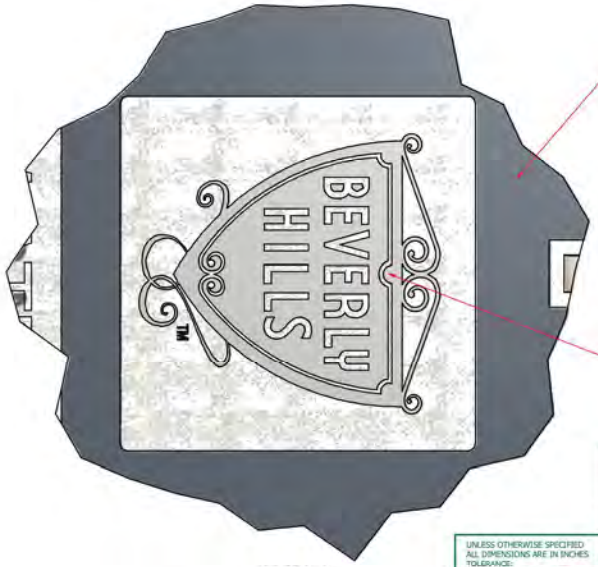






SECTION A-A


DETAIL B




DETAIL C

*CUSTOMER FORMAT DRAWING*

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
TOLERANCE:
XXX = +/- .0005
XX = +/- .005
X = +/- .050
FRACTION = +/- 1/8
ANGLE = +/- 1°

| | | |
|---|---|---|
| DRAWN | jvelazquez | 2/19/2009 |
| CHECKED | | |
| QA | | |
| MFG | | |
| APPROVED | JK Pickrell | 2/20/2009 |

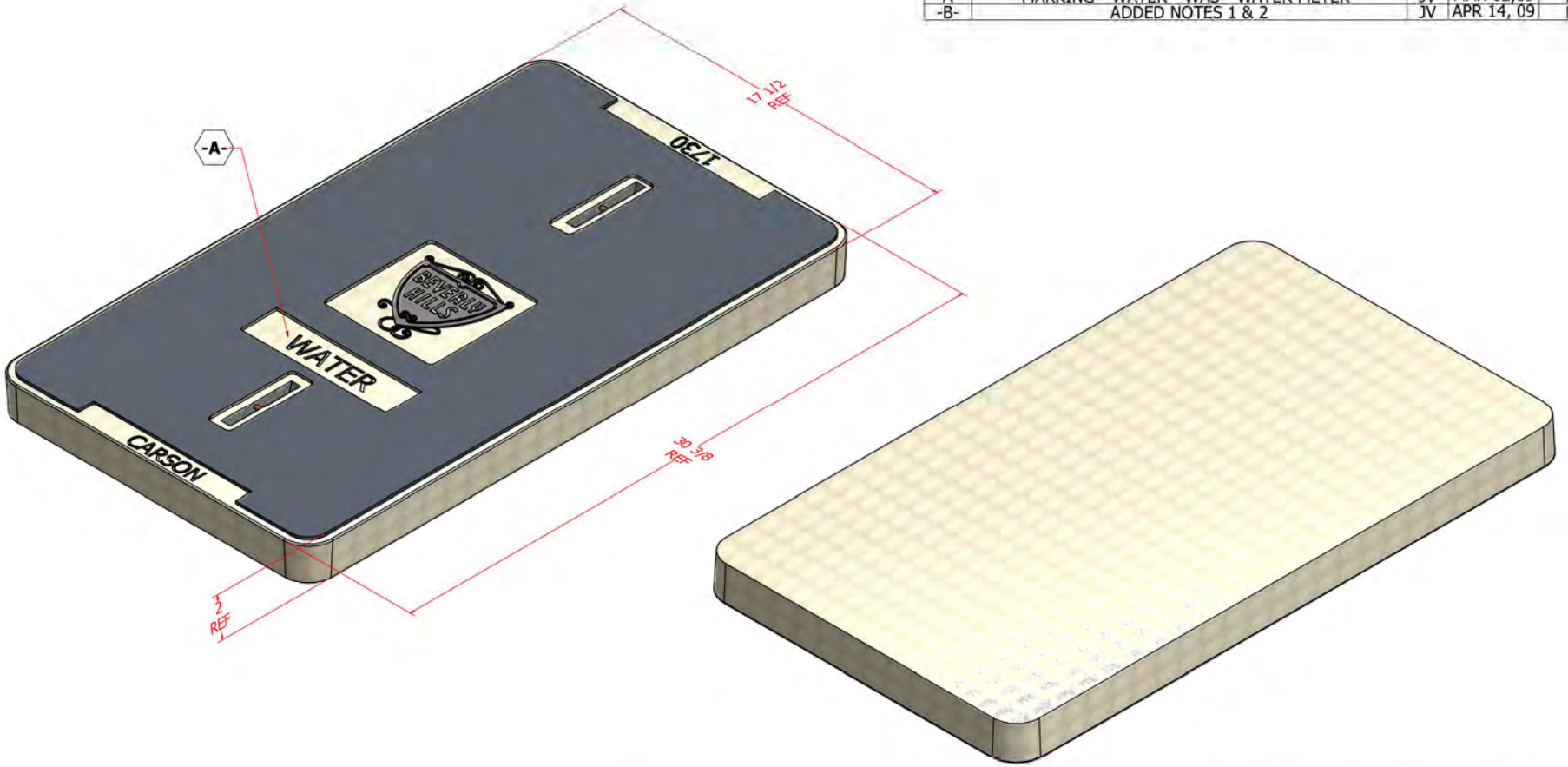
Oldcastle Precast
CARSON

TITLE: 1324 BC FLUSH COVER PC BEVERLY HILLS WATER 2x LIFTING EYES 0 BOLT HOLES

SIZE: D | DWG NO: 13245067 | REV: -B-

SCALE | SHEET 2 OF 2

| REVISIONS | | | | |
|---|---|---|---|---|
| REV | DESCRIPTION | BY | DATE | APPROVED |
| -A- | MARKING "WATER" WAS "WATER METER" | JV | MAR 02,09 | NTD |
| -B- | ADDED NOTES 1 & 2 | JV | APR 14, 09 | NTD |




MATERIAL: POLYMER CONCRETE GRAY

## CUSTOMER FORMAT DRAWING

ESTIMATED PART WEIGHT: 74.5 lbs.

-B-

NOTES:

1. COVER SHALL BE CONSTRUCTED OF REINFORCED POLYMER CONCRETE WITH A COMPRESSIVE STRENGTH GREATER THAN 11,000 PSI. TWO CONTINUOUS SHEETS OF WOVEN AND STICHED BOROSILICATE GLASS CLOTH SHALL REINFORCE THE UPPER, AND LOWER CROSS SECTIONS.
2. COEFFICIENT OF FRICTION SHALL BE GREATER THAN 0.5 (ASTM C-1028-96).

UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES
TOLERANCE:
.XXX = +/- .0005
.XX = +/- .005
.X = +/- .050
FRACTION = +/- 1/8
ANGLE = +/- 1°

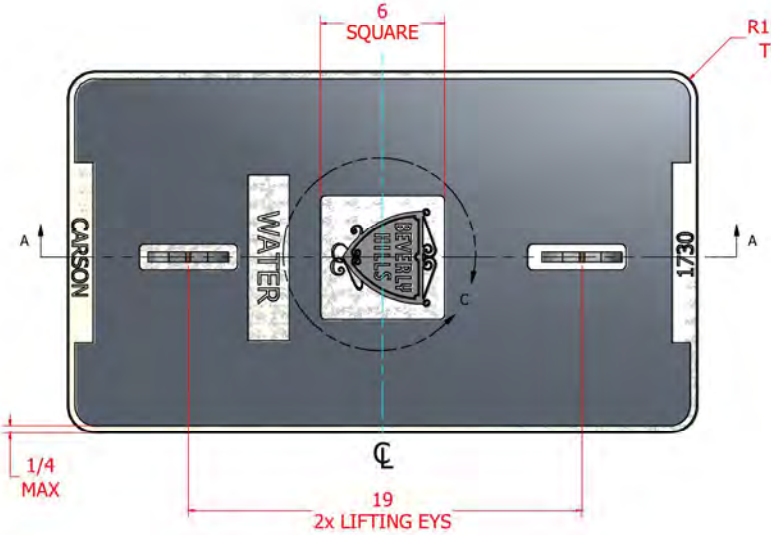
| | | |
|---|---|---|
| DRAWN | jvelazquez | 2/18/2009 |
| CHECKED | | |
| QA | | |
| MFG | | |
| APPROVED | JK Pickrell | 2/20/2009 |

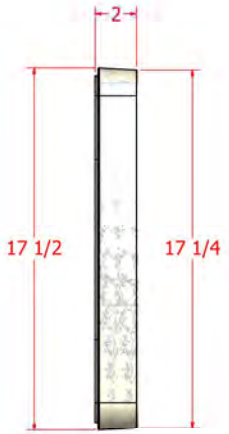
Oldcastle Precast
CARSON

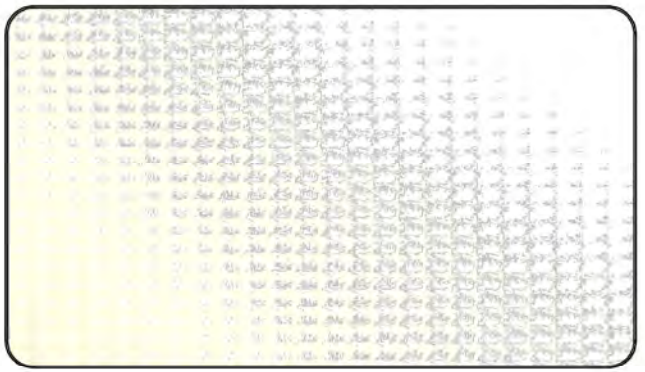
TITLE: 1730 BC FLUSH COVER PC BEVERLY HILLS WATER 2x LIFTING EYES 0x BOLT HOLES

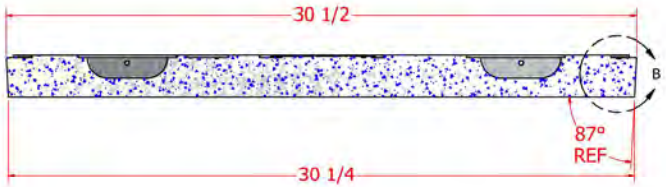
SIZE: D | DWG NO: 17305311 | REV: -B-

SCALE: | SHEET 1 OF 2

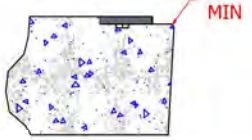


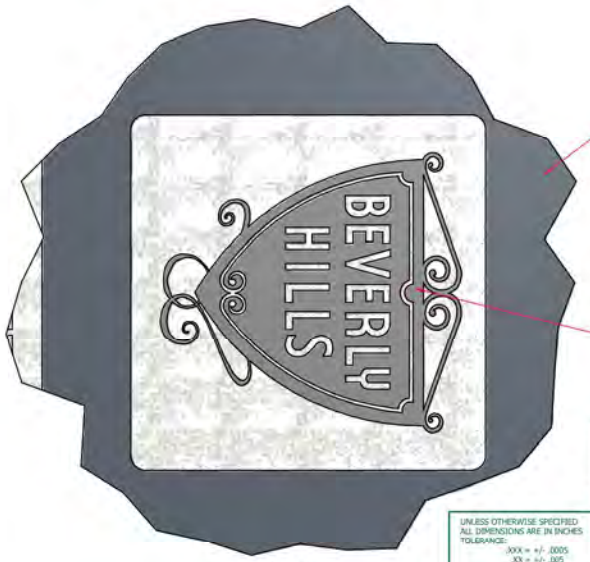






SECTION A-A




DETAIL B




DETAIL C

*CUSTOMER FORMAT DRAWING*

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
TOLERANCE:
XXX = +/- .0005
XX = +/- .005
X = +/- .050
FRACTION = +/- 1/8
ANGLE = +/- 1°

| | | |
|---|---|---|
| DRAWN | jvelazquez | 2/18/2009 |
| CHECKED | | |
| QA | | |
| MFG | | |
| APPROVED | JX Pickrell | 2/20/2009 |

Oldcastle Precast
CARSON

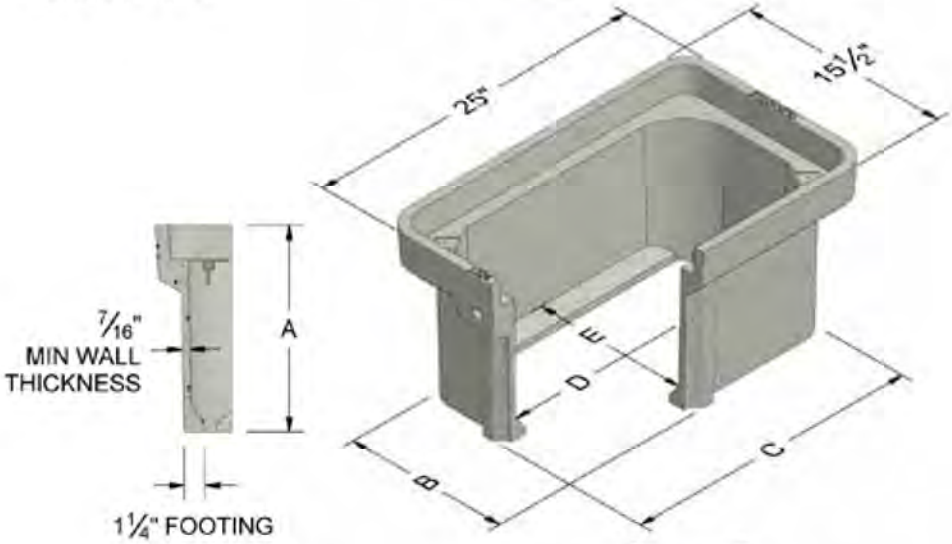
TITLE: 1730 BC FLUSH COVER PC BEVERLY HILLS WATER 2x LIFTING EYES 0x BOLT HOLES

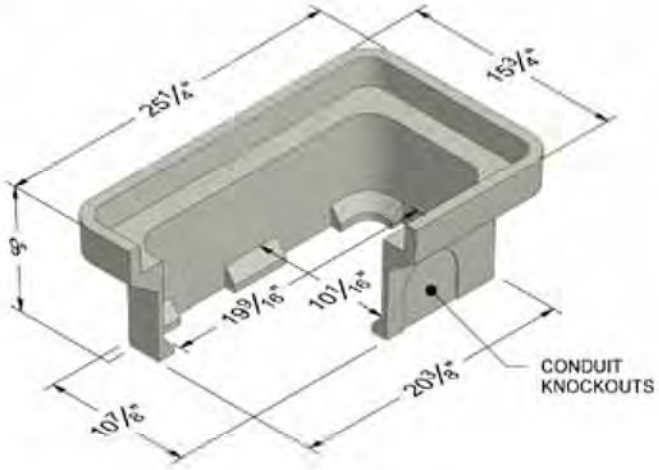
SIZE: D | DWG NO: 17305311 | REV: -B-

SCALE | SHEET 2 OF 2

# 1324

Bolt Down Detail


| | A | B | C | D | E |
|---|---|---|---|---|---|
| **1324-12** | 12" | 13 ½" | 23" | 20 7/8" | 11 3/8" |
| **1324-18** | 18" | 13 3/8" | 22 7/8" | 20 5/8" | 11 1/8" |
| **1324-24** | 24" | 13 ¼" | 22 ¾" | 20 3/8" | 10 7/8" |

* Surface demonstrates a coefficient of friction, both wet and dry, > 0.6 when tested by ASTM C1028.
Cover comes standard with permanent markings for manufacturer, load rating, model size and manufacturing location.

Contact your Oldcastle Precast Enclosure Solutions Distribution Center for specific information and additional options.

**COVER:**

| | |
|---|---|
| Style: | Flush Solid |
| Material: | Polymer Concrete |
| Weight: | Tier 15: 38 lbs |
| | Tier 22: 51 lbs |
| Std. Fasteners: | 3/8-16 Stainless Steel Hex Head |
| | Bolt, Washer and Floating Nut |
| Options: | Logos and Special Markings |
| Surface: | Slip Resistant & Marked* |

**BODY:**

| | |
|---|---|
| Material: | Polymer Concrete |
| Size: | 13" x 24" (L x W) |
| Weight: | 12" Depth: 51 lbs |
| | 18" Depth: 69 lbs |
| | 24" Depth: 88 lbs |
| Wall Type: | Straight |
| Performance: | Tier 22, WUC Category 3, ASTM C857 A-16 |

**EXTENSION:**

| | |
|---|---|
| Material: | Polymer Concrete |
| Size: | 13" x 24" (L x W) |
| Weight: | 9" Depth: 33 lbs |

Heavy Duty:
Incidental, Non-deliberate Traffic

For use in non-vehicular traffic situations only.

Actual load rating is determined by the box and cover combination

Weights and dimensions may vary slightly



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# 1324

## Options:

**Available Polymer Covers:**
Flush Solid (Standard)

**Available Steel Covers:**
One Piece

**Fastener Options for Polymer Covers:**
Penta Head Bolt
Oldcastle Enclosures Vandal Proof Bolt
Penta Coil Thread Bolt
Captive Bolt Retainer

**Custom Options for Polymer Covers:**
4" x 8" Plate with Custom Markings
EMS Markers

**Custom Options for H-Series Bodies:**
Ground Bus
Mouseholes/Knockouts
Pulling Eye
Dividers
Solid Bottom
Bodies are Stackable (with tallest body on bottom)

Polymer Cover


Steel Cover


## Raw Material Specifications:

| Standard Test Method | Properties of Raw Material | ASTM Designation | Test Results |
|---|---|---|---|
| Compressive Strength of Polymer Concretes | Compressive Strength | C 579 | > 11,000 psi |
| Flexural Properties of Plastic Materials | Flexural Strength | D 790 | > 3,000 psi |
| Resistance of Plastics to Chemical Reagents | Chemical Resistance | D 543 | Retain > 75% of original strength |
| Impact Resistance by Means of a Falling Weight | Impact Resistance | D 2444 | > 70 ft-lb |
| Static Coefficient of Friction | Friction Coefficient | C 1028 | > 0.6 |

ASTM Specifications shall be the current revision

Test Reports available on request

The Rural Utility Service (RUS) is a department of the US Department of Agriculture organized to facilitate rural developments. You will find Oldcastle Enclosure Solutions brand enclosures listed by the RUS. All Oldcastle Enclosure Solutions brand enclosures conform to the RUS "Tamper Resistant" fastener design for buried pedestals.

## Product Load Rating:

Heavy Duty : Non-deliberate Traffic
For use in non-vehicular traffic situations only.

## Note:

Actual load rating is determined by the box and cover combination. Weights and dimensions may vary slightly

All information contained on this sheet is current at the time of printing. Because of Oldcastle Precast, Inc.'s policy of ongoing research and development, the Company reserves the right to discontinue or update product information without notice.



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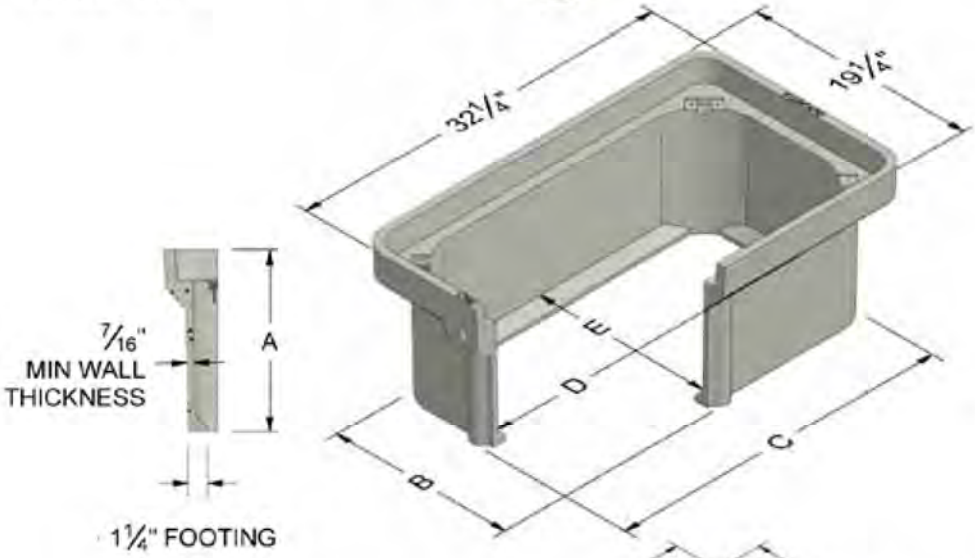
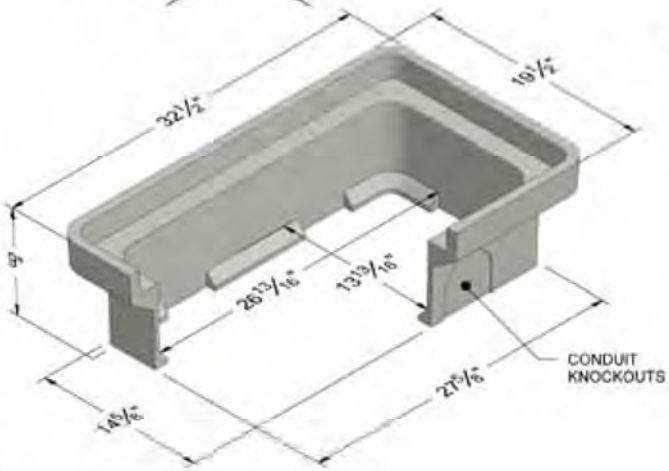
# 1730

Bolt Down Detail


| | A | B | C | D | E |
|---|---|---|---|---|---|
| **1730-12** | 12" | 17 ¼" | 30 ¼" | 28 3/16" | 15 3/16" |
| **1730-18** | 18" | 17 ⅛" | 30 ⅛" | 28" | 15" |
| **1730-24** | 24" | 17" | 30" | 27 ¾" | 14 ¾" |

* Surface demonstrates a coefficient of friction, both wet and dry, > 0.6 when tested by ASTM C1028.
Cover comes standard with permanent markings for manufacturer, load rating, model size and manufacturing location.

Contact your Oldcastle Precast Enclosure Solutions Distribution Center for specific information and additional options.

**COVER:**

| | |
|---|---|
| Style: | Flush Solid |
| Material: | Polymer Concrete |
| Weight: | Tier 15: 62 lbs |
| | Tier 22: 85 lbs |
| Std. Fasteners: | 3/8-16 Stainless Steel Hex Head |
| | Bolt, Washer and Floating Nut |
| Options: | Logos and Special Markings |
| Surface: | Slip Resistant & Marked* |

**BODY:**

| | |
|---|---|
| Material: | Polymer Concrete |
| Size: | 17" x 30" (L x W) |
| Weight: | 12" Depth: 65 lbs |
| | 18" Depth: 88 lbs |
| | 24" Depth: 114 lbs |
| Wall Type: | Straight |
| Performance: | Tier 22, WUC Category 3, |
| | ASTM C857 A-16 |

**EXTENSION:**

| | |
|---|---|
| Material: | Polymer Concrete |
| Size: | 17" x 30" (L x W) |
| Weight: | 9" Depth: 45 lbs |

Heavy Duty:
Incidental, Non-deliberate Traffic

For use in non-vehicular traffic situations only.

Actual load rating is determined by the box and cover combination

Weights and dimensions may vary slightly



©2012 Oldcastle Precast, Inc.

# 1730

## Options:

**Available Polymer Covers:**
Flush Solid (Standard)
Flush (2 Piece) Uni-Half
Pedestal Provisions

**Available Steel Covers:**
One Piece

**Fastener Options for Polymer Covers:**
Penta Head Bolt
Oldcastle Enclosures Vandal Proof Bolt
Penta Coil Thread Bolt
Captive Bolt Retainer

**Custom Options for Polymer Covers:**
4" x 8" Plate with Custom Markings
EMS Markers

**Custom Options for H-Series Bodies:**
Ground Bus
Cable Rack
Mouseholes/Knockouts
Pulling Eye
Universal Mounting Plate
Dividers
Solid Bottom
Bodies are Stackable (with tallest body on bottom)

Polymer Cover


Steel Cover


Uni-Half Cover


Pedestal Provision


Uni-Half Detail


Hex Head
Penta Head
Vandal Proof

## Raw Material Specifications:

| Standard Test Method | Properties of Raw Material | ASTM Designation | Test Results |
|---|---|---|---|
| Compressive Strength of Polymer Concretes | Compressive Strength | C 579 | > 11,000 psi |
| Flexural Properties of Plastic Materials | Flexural Strength | D 790 | > 3,000 psi |
| Resistance of Plastics to Chemical Reagents | Chemical Resistance | D 543 | Retain > 75% of original strength |
| Impact Resistance by Means of a Falling Weight | Impact Resistance | D 2444 | > 70 ft-lb |
| Static Coefficient of Friction | Friction Coefficient | C 1028 | > 0.6 |

ASTM Specifications shall be the current revision

Test Reports available on request

The Rural Utility Service (RUS) is a department of the US Department of Agriculture organized to facilitate rural developments. You will find Oldcastle Enclosure Solutions brand enclosures listed by the RUS. All Oldcastle Enclosure Solutions brand enclosures conform to the RUS "Tamper Resistant" fastener design for buried pedestals.

## Product Load Rating:

Heavy Duty : Non-deliberate Traffic
For use in non-vehicular traffic situations only.

## Note:

Actual load rating is determined by the box and cover combination. Weights and dimensions may vary slightly

All information contained on this sheet is current at the time of printing. Because of Oldcastle Precast, Inc.'s policy of ongoing research and development, the Company reserves the right to discontinue or update product information without notice.



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